Vol. 994 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

May 27, 1980

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

May 27, 1980 Volume 994 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

Jan. 28, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Board of Appeals Decisions Rendered in the Month of April 1980

Affirmed	173
Affirmed in part	26
Reversed	61
Total	260

Petitions in Interference Cases From Decisions of The Board on Motions for Additional Discovery Under 37 CFR 1.287(c)

Notwithstanding the clear statement in the last sentence of 37 CFR 1.287(c), parties in interference cases continue to seek review by the Commissioner of decisions of the Board of Patent Interferences on motions for additional discovery under 37 CFR 1.287(c). Review of such a decision can be had along with judicial review of a decision on the question of priority. *Cochran* v. *Kreseck*, 530 F.2d 385, 188 USPQ 553 (CCPA 1976); *Comstock* v. *Kroekel*, 200 USPQ 548 (Comm'r. Pat. 1978). Accordingly, parties in interference cases are reminded that a petition to the Commissioner should not be filed for the purpose of seeking review of an interlocutory decision of the Board granting or denying a motion for additional discovery under 37 CFR 1.287(c). See also *Fenstermacher* v. *Daugherty*, 189 USPQ 536 (Comm'r. Pat. 1975) and *Sheehan* v. *Doyle*, 202 USPQ 783 (Comm'r. Pat. 1978). The filing of such a petition only serves to delay the ultimate disposition of interferences on the merits. The filing of a paper for the mere purpose of delay is not permitted by the rules. 37 CFR 1.346. The Board of Patent Interferences will no longer grant a stay of proceedings pending disposition of a petition to the Commissioner seeking review of a decision of the Board on a motion for additional discovery under 37 CFR 1.287(c).

Dated: Apr. 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,396,067, Re. S.N. 124,917, Filed Feb. 26, 1980, Cl. 428/330, RESINOUS PRODUCT SIMULATING ONYX, Kenneth A. Schafer, Owner of Record: *Larry Singer, Kirkland, Quebec, Canada,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 164

3,469,571, Re. S.N. 125,453, Filed Feb. 28, 1980, Cl. 128/654, DEVICE FOR ADMINISTERING A FLUID INTO THE INTESTINAL TRACT, Alexander A. Vass, Owner of Record: *Inventor,* Attorney or Agent: George Gottlieb, et al., Ex. Gp.: 335

3,669,106, Re. S.N. 127,361, Filed Mar. 4, 1980, Cl. 128/132 D, SURGICAL DRAPE WITH ADHESIVE ATTACHMENT MEANS, Mark S. Schrading, et al., Owner of Record: *Kimberly-Clark Corporation, Neenah, Wis.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 335

3,805,571, Re. S.N. 125,750, Filed Feb. 28, 1980, Cl. 72/202, APPARATUS FOR CONTINUOUS TREATMENT OF LOW-CARBON COLD-ROLLED STEEL SHEET HAVING EXCELLENT COLD WORKING PROPERTIES, Kenzo Toda, et al., Owner of Record: *Nippon Steel Corporation, Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 321

3,952,769, Re. S.N. 128,264, Filed Mar. 7, 1980, Cl. 137/344, ALIGNMENT CONTROL APPARATUS FOR CENTER PIVOT IRRIGATION EQUIPMENT, Eduard K. Ott, Owner of Record: *Frontier Machinery Company, Walla Walla, Wash.,* Attorney or Agent: Richard J. St. John, et al., Ex. Gp.: 341

4,022,929, Re. S.N. 124,005, Filed Feb. 25, 1980, Cl. 427/69, METHOD OF ALUMINIZING THE INSIDE OF THE PANEL OF A TELEVISION PICTURE TUBE, Eberhard Nill, et al., Owner of Record: *International Standard Electric Corporation, New York, N.Y.,* Attorney or Agent: Walter J. Baum, et al., Ex. Gp.: 162

4,055,964, Re. S.N. 088,174, Filed Feb. 27, 1980, Cl. 62/238, HEAT PUMP SYSTEM, Paul F. Swenson, et al., Owner of Record: *The United States of America as represented by The United States Department of Energy, Washington, D.C.,* Attorney or Agent: John F. Pearne, et al., Ex. Gp.: 344

4,064,376, Re. S.N. 097,595, Filed Nov. 27, 1979, Cl. 179/146 H, SOUND REPRODUCTION SYSTEM AND DEVICE, Kyoto Yamada, Owner of Record: *Bodysonic Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: James C. Wray, Ex. Gp.: 235

4,077,212, Re. S.N. 127,250, Filed Mar. 4, 1980, Cl. 60/431, HYDROSTATIC TRANSMISSION CONTROL, Kenneth W. S. Foster, Owner of Record: *Renold Limited, Manchester, England,* Attorney or Agent: Stephen Frishauf, et al., Ex. Gp.: 341

4,079,149, Re. S.N. 070,271, Filed Aug. 27, 1979, Cl. 260/566, BENZYL OXIME ETHERS, Arthur C. Henry, Owner of Record: *Shell Oil Company, Houston, Tex.,* Attorney or Agent: Frank R. LaFontaine, Ex. Gp.: 126

4,091,918, Re. S.N. 124,120, Filed Feb. 25, 1980, Cl. 206/45.13, CONTAINER-CARD FILE STRUCTURE, George Soulakis, et al., Owner of Record: *Eldon Industries, Inc., Hawthorne, Calif.,* Attorney or Agent: Edward D. O'Brian, Ex. Gp.: 241

4,096,301, Re. S.N. 127,220, Filed Mar. 4, 1980, Cl. 427/430 A, APPARATUS AND METHOD FOR AUTOMATICALLY MAINTAINING AN ELECTROLESS COPPER PLAYING BATH, Leo J. Slominski, et al., Owner of Record: *MacDermid Incorporated, Waterbury, Conn.,* Attorney or Agent: Merrill F. Steward, et al., Ex. Gp.: 162

4,112,436, Re. S.N. 127,679, Filed Mar. 6, 1980, Cl. 346/140 R, GLASS NOZZLE ARRAY FOR AN INK JET PRINTER AND METHOD OF FORMING SAME, Donald R. Cone Jr., Owner of Record: *The Mead Corporation, Dayton, Ohio,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 211

4,136,408, Re. S.N. 124,121, Filed Feb. 26, 1980, Cl. 4/172.12, LIGHTWEIGHT REMOVABLE COVER FOR A POOL, GREENHOUSE OR THE LIKE, Edwin L. Dahlbeck, et al., Owner of Record: *Inventors,* Attorney or Agent: Richard W. Seed, et al., Ex. Gp.: 243

4,144,170, Re. S.N. 125,634, Filed Feb. 28, 1980, Cl. 210/221, APPARATUS FOR WATER TREATMENT, Karl R. Dunkers, Owner of Record: *Inventor,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 176

4,146,635, Re. S.N. 123,792, Filed Feb. 22, 1980, Cl. 428/283, ANTI-SKID, WEAR- AND STRESS-RESISTING ROAD MARKING TAPE MATERIAL, Ludwig Eigenmann, Owner of Record: *Inventor,* Attorney or Agent: Michael J. Striker, et al., Ex. Gp.: 164

4,152,341, Re. S.N. 127,135, Filed Mar. 4, 1980, Cl. 260/395, TRIARYL OR DIARYLPYRIDYL METHANES, Geraint Jones, et al., Owner of Record: *Imperial Chemical Industries Limited, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 117

4,166,952, Re. S.N. 126,139, Filed Feb. 29, 1980, Cl. 250/288, METHOD AND APPARATUS FOR THE ELEMENTAL ANALYSIS OF SOLIDS, Bruce Noble Colby, et al., Owner of Record: *E. I. du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Charles A. Weigel, Jr., Ex. Gp.: 256

4,169,769, Re. S.N. 118,543, Filed Feb. 4, 1980, Cl. 204/1 T, METHOD FOR CONVEYING A GAS SAMPLE THROUGH AN ANALYZER CHAMBER, David M. Capone, Owner of Record: *Ametek Inc., New York, N.Y.,* Attorney or Agent: Stanley J. Price Jr., Ex. Gp.: 114

PATENT NOTICES

Certificates of Correction for the Week of May 27, 1980

D. 253,069	4,168,915	4,180,782	4,186,900
3,836,717	4,169,475	4,181,205	4,187,306
3,996,077	4,170,194	4,181,570	4,187,815
4,034,772	4,170,866	4,181,937	4,187,890
4,086,074	4,171,234	4,182,083	4,187,892
4,093,663	4,173,048	4,182,249	4,187,934
4,107,416	4,173,320	4,182,498	4,188,310
4,113,159	4,173,566	4,182,882	4,188,593
4,127,883	4,173,682	4,183,862	4,188,644
4,134,541	4,174,282	4,184,016	4,188,671
4,141,035	4,174,644	4,184,139	4,188,916
4,141,868	4,174,900	4,184,840	4,189,016
4,143,970	4,176,204	4,184,942	4,189,255
4,145,399	4,177,467	4,185,008	4,189,376
4,156,282	4,178,280	4,185,211	4,189,417
4,158,228	4,178,873	4,185,642	4,189,465
4,159,741	4,179,786	4,185,681	4,189,544
4,160,156	4,179,790	4,186,067	4,189,577
4,160,271	4,179,808	4,186,086	4,189,615
4,168,316	4,180,029	4,186,639	4,189,648
4,168,705	4,180,781	4,186,886	4,189,722
			4,189,779

Disclaimers

Re. No. 29,536.—*Donald David Fearing*, Mahtomedi, Minn. MARKING TAG. Patent dated Feb. 14, 1978. Disclaimer filed Mar. 28, 1980, by the inventor.

Hereby disclaims the term of said patent subsequent to Dec. 10, 1987.

4,118,368.—*Nobuo Soma, Syoji Morimura, Takao Yoshioka* and *Tomoyuki Kurumada*, Tokyo, Japan. SYNTHETIC POLYMER STABILIZERS. Patent dated Oct. 3, 1978. Disclaimer filed Mar. 25, 1980, by the assignee, *Sankyo Company Limited*.

Hereby enters this disclaimer to claim 6 of said patent.

4,159,219.—*Richard J. Evans*, Lancaster, Pa. METHOD FOR PRODUCING AN UNBACKED TENSION FLOOR. Patent dated June 26, 1979. Disclaimer filed Mar. 31, 1980, by the assignee, *Armstrong Cork Company*.

Hereby enters this disclaimer to claims 1, 2 and 4 of said patent.

4,180,915.—*Melvin H. Lill*, San Jose and *James L. Wiederrick*, Lodi, Calif. RUNOUT COMPENSATION IN VEHICLE WHEEL ALIGNMENT MEASURING APPARATUS. Patent dated Jan. 1, 1980. Disclaimer filed Mar. 7, 1980, by the assignee, *FMC Corporation*.

Hereby disclaims the term of said patent subsequent to Feb. 13, 1996.

Erratum

All reference to Patent No. 4,191,429 to Richard J. Reitz and Edward J. Kruke, both of Ohio, for FLUID PRESSURE BRAKING SYSTEM HAVING EMERGENCY VALVE appearing in the OFFICIAL GAZETTE of Mar. 4, 1980, should be deleted since the patent should not have issued.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents much include the patent number.

Copies of patent applications cited are available from the National Tchnical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444
Pentagon, Washington, D.C. 20310

Patent 4,118,668. R. F. Network Antenna Analyzer Employing Sampling Techniques and Having Remotely Located Sampling Probes. Filed Sept. 12, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent application 6–003,179. Coaxial Terminal Protection Device With Disposable Cartridge. Filed Jan. 15, 1979.

Patent application 6–008,627. Fluidic Valve. Filed Feb. 1, 1979.

Patent application 6–014,503. Temperature-Compensated Laminar Proportional Amplifier. Filed Feb. 23, 1979.

Patent application 6–019,031. Solid-Medium Coherent Optical Processor. Filed Mar. 9, 1979.

Patent application 6–019,032. Complex Spatial Modulator. Filed Mar. 9, 1979.

Patent application 6–024,234. Multislot Bicone Antenna. Filed Mar. 26, 1979.

Patent application 930,968. Fluidic Element With Substantially Zero Null Off-Set. Filed Aug. 4, 1978.

Patent application 952,521. Submillimeter Wave Generation Using Surface Acoustic Waves in Piezoelectric Materials. Filed Oct. 18, 1978.

Patent application 953,292. Null Balancing for Fluidic Sensors and Amplifiers. Filed Oct. 20, 1978.

Patent application 954,264. Method and Apparatus for Examining Structures Using Stimulated Acoustic Emission. Filed Oct. 24, 1978.

Patent application 957,779. Improved Phase Measuring Device. Filed Nov. 6, 1978.

Patent application 963,719. Fluerie Notch Filter Temperature of Density Sensor. Filed Nov. 27, 1978.

Patent application 963,720. Non-Contact Fluerie Temperature Sen-ing Method and Apparatus. Filed Nov. 27, 1978.

Patent application 966,839. Conformal Spiral Antenna. Filed Dec. 6, 1978.

Patent 4,118,676. Method and Apparatus for Driving an Optical Waveguide With Coherent Radiation. Filed Oct. 22, 1976. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,119,038. Controlled Activation of Reserve Power Supplies. Filed May 13, 1977. Patented Oct. 10, 1978. Not available NTIS.

Patent 4,139,277. Acousto-Optic Memory Correlator. Filed June 7, 1977. Patented Feb. 13, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,166,597. Stowable and Inflatable Vehicle. Filed May 9, 1974. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,166,598. Vehicle Enshrouding Apparatus. Filed May 30, 1974. Patented Sept. 4, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6-053,475. Control of Parasitic Mites. Filed June 29, 1979.

Patent application 6-056,652. Melting Icebergs to Produce Fresh Water and Mechanical Energy. Filed July 11, 1979.

Patent application 6-083,694. Method of Applying Herbicide. Filed Oct. 11, 1979.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 954,381. System for Testing Optical Fibers. Filed Oct. 24, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6-050,554. 1,2-Diaminocyclohexane Platinum (II) Complexes Having Antineoplastic Activity. Filed June 20, 1979.

Patent 4,183,360. Multifinger Photocell Plethysmography System. Filed July 26, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,258. Powder Blower Device. Filed Jan. 30, 1978. Patented Jan. 22, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6-053,664. The Application of Inductively Coupled Plasma Emission Spectrometry to the Elemental Analysis of Organic Compounds and to the Determination of the Empirical Formulas for These and Other Compounds. Filed July 2, 1979.

Patent application 6-067,648. Method of Extending the Fatigue Life of Wire Rope. Filed Aug. 17, 1979.

Patent application 6-068,998. Dual Ground Plane Stripline Fed Microstrip Antennas. Filed Aug. 23, 1979.

Patent application 6-069,654. Apparatus and Method for Submicron Pattern Generation. Filed Aug. 27, 1979.

Patent application 6-078,257. Dielectric Corona Rings. Filed Sept. 24, 1979.

Patent application 6-079,010. Corner Fed Electric Microstrip Dipole Antenna. Filed Sept. 26, 1979.

Patent application 6-080,596. Omnidirectional Microstrip Antenna. Filed Oct. 1, 1979.

Patent application 6-081,737. Laser Speckle Eliminator. Filed Oct. 4, 1979.

Patent application 953,509. Quick Disconnect Electrical Connector Having Disassembly Features for Refurbishment. Filed Oct. 23, 1978.

Patent application 958,751. Field Determined Propagation Circuit. Filed Nov. 8, 1978.

Patent application 958,913. Crosstie Memory Bit Stretcher Detector. Filed Nov. 8, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP-2, Washington, D.C. 20546

Patent application 6-067,596. Indirect Microbial Detection. Filed Aug. 17, 1979.

Patent application 6-069,429. Induction Heating Gun. Filed Aug. 24, 1979.

Patent application 6-086,508. Wide Angle Optical Systems. Filed Oct. 19, 1979.

Patent application 6-088,663. Use of Glow Discharge in Fluidized Beds. Filed Oct. 26, 1979.

Patent application 6-089,779. Corrosion Resistent Thermal Barrier Coating. Filed Oct. 31, 1979.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
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	Sacramento: California State Library	(916) 322–4572
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	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
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New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 19, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-18-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-8-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	4-19-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	8-20-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-1-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	2-18-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-23-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-13-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	9-5-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-3-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	4-25-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-19-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	4-2-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-9-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-8-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	11-28-78

Expiration of patents: The patents within the range of numbers indicated below expire during April 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,083,367 to 3,088,113, inclusive
Plant Patents ..... Numbers 2,244 to 2,257, inclusive

REISSUES

MAY 27, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

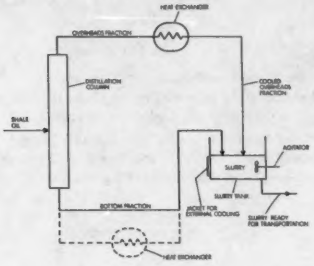
Re. 30,281
TRANSPORTATION OF WAXY HYDROCARBON MIXTURE AS A SLURRY

James E. Tackett, and Paul H. Stewart, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Original No. 3,910,299, dated Oct. 7, 1975, Ser. No. 524,008, Nov. 15, 1974. Application for reissue Aug. 25, 1978, Ser. No. 936,702

Int. Cl.[2] F17D *1/16*

U.S. Cl. 137—13 **19 Claims**



1. A process of transporting and/or storing a waxy hydrocarbon mixture containing 1 to about 80% by weight of wax comprising fractionating the hydrocarbon mixture into at least an overheads fraction and a bottoms fraction (contains at least a majority of the wax), mixing at a shear rate less than about 20 sec^{-1} at least a portion of the overheads fraction which has been cooled to a temperature sufficiently low so that when it is slurried with the bottoms fraction the resulting temperature will be at least below that at which the hydrocarbon mixture will be transported, with at least a major portion of the bottoms fraction which has been heated to a temperature above that at which wax crys..llization is effected, to obtain a slurry and thereafter storing or transporting the slurry.

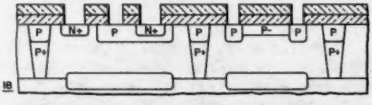
Re. 30,282
DOUBLE MASTER MASK PROCESS FOR INTEGRATED CIRCUIT MANUFACTURE

Merrill R. Hunt, San Diego, Calif.; Christopher A. Ladas, Tempe, and Sal T. Mastroianni, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Original No. 4,021,270, dated May 3, 1977, Ser. No. 700,432, Jun. 28, 1976. Application for reissue Jul. 3, 1978, Ser. No. 921,924

Int. Cl.[3] H01L *21/265*

U.S. Cl. 148—1.5 **17 Claims**



15. A self-aligned method of manufacturing integrated circuits comprising the steps of:

(a) providing a buried layer and an upper layer over a semiconductor substrate, said upper layer and said buried layer being of a first conductivity type, and said substrate being of a second conductivity type opposite to said first conductivity type;

(b) [depositing] *forming* a first masking layer over [the upper surface of] said upper layer;

(c) [depositing] *forming* a second masking layer [of the upper surface of] *over* said first masking layer;

(d) forming a predetermined pattern of openings in said second layer, said predetermined pattern comprising a first and a second group of openings;

(e) forming a first group of semiconductor device regions by applying impurities through openings etched through said first masking layer using said first group of openings as an etching mask;

(f) forming a second group of semiconductor device regions by applying impurities through openings etched through said first masking layer using said second group of openings as an etching mask; [(g) forming shallow device regions, said shallow device regions overlaying the upper surfaces of said first and said second group of device regions and said shallow device regions being formed irrespective of said predetermined pattern of openings;]

[(h)] *(g)* removing said first and said second masking layers;

[(i) depositing] *(h) forming* a third masking layer over [the upper surface of] said upper layer;

[(j) depositing] *(i) forming* a fourth masking layer over [the upper surface of] said third masking layer;

[(k)] *(j)* forming a *second* predetermined pattern of openings in said fourth layer, said *second* predetermined pattern comprising a third and a fourth group of openings;

[(l)] *(k)* forming a third group of semiconductor device regions by applying impurities through openings etched through said third masking layer using said third group of openings as an etching mask; and

[(m)] *(l)* forming a group of contact openings through said third masking layer using said fourth group of openings as an etching mask.

Re. 30,283
SULFONIUM COMPOUNDS AS CORROSION INHIBITORS IN AQUEOUS ACIDIC CLEANING SOLUTIONS

Wayne W. Frenier, Tulsa, Okla., and William J. Settineri, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

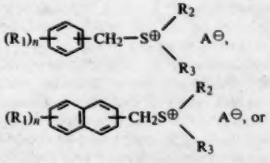
Original No. 4,101,438, dated Jul. 18, 1978, Ser. No. 669,116, Mar. 22, 1976. Continuation of Ser. No. 350,295, Apr. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 118,175, Feb. 23, 1971, Pat. No. 3,764,543. Application for reissue Feb. 13, 1979, Ser. No. 11,745

The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.

Int. Cl.[2] C11D *7/34*; C23G *1/06*

U.S. Cl. 252—151 **20 Claims**

1. An aqueous acidic cleaning solution of at least one organic acid having dissolved or dispersed therein a sulfonium salt corresponding to the formula



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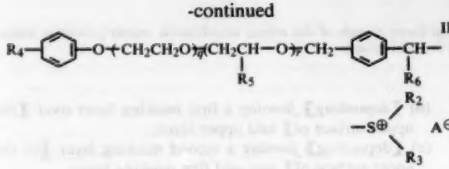


III

wherein n is 1 or 2; each R_1 independently is hydrogen or a hydrocarbyl, a hydrocarbyl whose chain length is interrupted by an atom of oxygen or sulfur, a hydrocarbyloxyor a hydrocarbylthio radical of from 1 to about 24 carbon atoms; R_2 is a hydrocarbyl or inertly-substituted hydrocarbyl radical of from 1 to about 24 carbon atoms, with the proviso that the total aggregate carbon content of R_1 and R_2 is from 7 to about 25; R_3 is an alkyl radical of from 1 to 4 carbon atoms or an inertly-substituted alkyl radical of from 2 to 4 carbon atoms, allyl, phenyl or an inertly-substituted phenyl radical; or R_2 and R_3 are joined to form a 5- or 6-membered heterocyclic ring, with the proviso that the total aggregate carbon content of R_1, R_2 and R_3 is from 10 to about 25; R_4 is alkyl of 4 to about 20 carbon atoms; R_5 is methyl or ethyl; R_6 is hydrogen, methyl or ethyl; q is an integer of from 0 to 8; r is an integer of from 0 to 10, with the proviso that the sum of q plus r is equal to or less than 10; and $A^{\ominus}$ is an anion; said sulfonium salt being present in an amount at least sufficient to inhibit the acid-induced corrosion of ferrous metals in contact with said solution and ferric ions.

Re. 30,284
POLYMERIC ALKOXYSILANES

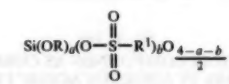
Walter L. Magee, Jr., Danbury, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Original No. 4,042,612, dated Aug. 16, 1977, Ser. No. 756,310, Jan. 3, 1977. Application for reissue Apr. 24, 1978, Ser. No. 899,683

Int. Cl.² C07F *7/18*

U.S. Cl. 556—428 **6 Claims**

1. A polymeric alkoxysilane having the average formula



wherein each R is an independently selected hydrocarbon radical or hydrocarbon ether radical free of aliphatic unsaturation, each R^1 is an independently selected hydrocarbon radical free of aliphatic unsaturation, a has a value from 1 to 3 and b has a value from [0.001] *0.0001* to 1.0.

Re. 30,285
SPRAYING DEVICES, IN PARTICULAR NEBULIZING DEVICES

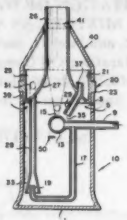
Robert S. Babington, 1113 Ingleside Ave., McLean, Va. 22101

Original No. 3,864,326, dated Feb. 4, 1975, Ser. No. 255,681, May 22, 1972. Application for reissue Feb. 4, 1977, Ser. No. 765,724

Int. Cl.² F02M *15/04*

U.S. Cl. 261—78 A **26 Claims**

1. A nebulizing unit comprising in combination, a base flask having an open top; a closure member for said flask, said closure member including at least one vertical chimney having a flaring lower end; a collar surrounding the lower end of the chimney and defining first, a support for the chimney and, secondly, with the chimney end, an annular holding reservoir; a first conduit opening into said reservoir and having a lower terminal end disposed beneath the reservoir at a point closely adjacent the bottom of the base flask; at least a second conduit opening into said holding reservoir and having one end disposed in the lowermost point thereof and the opposite end disposed below the bottom of the holding reservoir and projecting into the base flask adjacent its mouth; at least one plenum chamber having a spherical end with an aperture therein disposed within the base flask and beneath the terinal



end of said second mentioned conduit; and its opposite end disposed outside of the side wall of said base flask; a branch line in communication with said plenum chamber and having a terminal end disposed adjacent the bottom of said base flask and in registry with said first mentioned conduit opening into said holding reservoir and discharging therein.

Re. 30,286
METHOD OF PRODUCING HIGH DENSITY SILICON CARBIDE PRODUCT

John A. Coppola, and Richard H. Smoak, both of Lewiston, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Original No. 4,080,415, dated Mar. 21, 1978, Ser. No. 743,448, Nov. 22, 1976. Application for reissue Mar. 19, 1979, Ser. No. 21,878

Int. Cl.² C04B *35/56*

U.S. Cl. 264—65 **8 Claims**

1. A method of sintering silicon carbide powders containing boron or boron-containing compounds as densification aids to produce a high density silicon carbide ceramic material which comprises the step of sintering such powders in an atmosphere containing boron, wherein the partial pressure of boron in the sintering atmosphere is equal to or greater than the equilibrium vapor pressure of the boron in the silicon carbide powder during sintering of said powder, *said partial pressure of boron in the sintering atmosphere being provided by boron from a boron-containing slurry or solution applied to the interior of the sintering chamber prior to sintering, or by the addition of a boron-containing gas into the chamber during sintering .*

Re. 30,287
19 HYDROXY PROSTAGLANDINS

Arthur F. Marx, Delft, and Jean Doodewaard, Schipluiden, both of Netherlands, assignors to Gist-Brocades N.V., Netherlands

Original No. 4,054,595, dated Oct. 18, 1977, Ser. No. 561,895, Mar. 25, 1975. Application for reissue Oct. 26, 1978, Ser. No. 955,005

Claims priority, application United Kingdom, Mar. 26, 1974, 13399/74; Mar. 26, 1974, 13400/74

Int. Cl.² C07C *177/00*

U.S. Cl. 562—503 **2 Claims**

8. A compound which is selected from 9-keto-11α,15α,19 - trihydroxy-prost-13(t)-enoic acid, pharmaceutically acceptable salts or aliphatic esters thereof containing 1 to 5 carbon atoms.

Re. 30,288

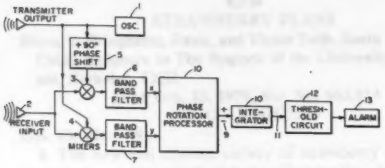
INTRUSION DETECTION SYSTEM

Kenneth R. Hackett, Boulder, Colo., assignor to Pittway Corporation, Northbrook, Ill.

Original No. 3,942,178, dated Mar. 2, 1976, Ser. No. 455,260, Mar. 27, 1974. Application for reissue Dec. 16, 1977, Ser. No. 861,214

Int. Cl.[2] G01S *9/02*; G08B *13/24*

U.S. Cl. 343—5 PD **13 Claims**



11. In an echo signal intrusion alarm system having enhanced detection capability for return echos from a moving object in the presence of interference and clutter return wherein a signal is transmitted into a protected zone and reflected signals are received from said zone, said system including first and second quadrature mixing means for mixing signals corresponding to the transmitted and received signals to produce direction sensitive quadrature output signals in accordance with the beat frequency between said transmitted and received signals, the improvement comprising:

means for multiplying one of said quadrature output signals by a factor obtained from the time derivative of the other quadrature output signal to obtain the four-quadrant product of the signal and factor multiplied;

limiting means operative on said time derivative to obtain said factor for making said four-quadrant product proportional to the amplitude of only said one of said quadrature output signals;

integrating means responsive to said product for cancelling opposite polarity signal components corresponding to said interference and clutter return and accumulating an integrated signal magnitude from signal components of the same polarity corresponding to a given direction of motion for said moving object; and

means responsive to a predetermined accumulated level of said integrated signal magnitude for producing an alarm signal.

PLANT PATENTS

GRANTED MAY 27, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,538

STRAWBERRY PLANT

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 23, 1978, Ser. No. 953,814

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

4,539

TOMATO PLANT

Carroll G. Briggs, San Juan Bautista, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 11, 1978, Ser. No. 968,072

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct variety of a hybrid tomato plant substantially as herein shown and described, characterized as to novelty by uniform crop characteristics, low grading loss, high yields, low percentage of fruit with stems, low percentage of fruit ripening defects, multiple disease resistance and tolerance.

4,540

PRUNUS SUBHIRTELLA

William Flemer, III, Princeton, N.J., assignor to Treesearch, Kingston, N.J.

Filed Jan. 25, 1979, Ser. No. 6,509

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of flowering cherry tree of the species botanically known as *Prunus subhirtella,* substantially as herein shown and described, characterized particularly as to novelty by the unique combination of the deep purplish pink color of the flower, the very abundant quantity of blooms, the semi-double form of the flowers, the ability of the flower buds to survive extremely low temperatures, and the long lastingness of the blooms averaging six days longer than other Higan Cherry Trees growing in the vicinity.

PLANT PATENTS

GRANTED MAY 17, 1938

PATENTS

GRANTED MAY 27, 1980

ERRATA

For CLASS	See PATENT NO.
433–177	4,204,321
433–185	4,204,322
433–038	4,204,323
433–009	4,204,325
433–050	4,204,326
433–029	4,204,328
433–136	4,204,329
433–148	4,204,330
368–035	4,204,395
368–287	4,204,396
368–202	4,204,397
368–047	4,204,398
368–240	4,204,399
084–484	4,204,400
206–397	4,204,479
123–001	4,204,481
123–032 EE	4,204,482
123–032 EL	4,204,483
123–032 SP	4,204,484
123–034 A	4,204,485
123–041.6	4,204,486
123–041.35	4,204,487
123–073 A	4,204,488
123–073 A	4,204,489
123–102	4,204,490
239–017	4,204,631
371–027	4,204,633
371–038	4,204,634
354–281	4,204,724
355–003 R	4,204,725
355–003 DR	4,204,726
355–003 R	4,204,727
355–004	4,204,728
355–011	4,204,729
355–014 R	4,204,730
355–016	4,204,731
355–055	4,204,732
355–064	4,204,733
355–068	4,204,734
355–075	4,204,735
355–118	4,204,736
414–458	4,204,797
414–750	4,204,798

ERRATA—Continued

For CLASS	See PATENT NO.
065–025 A	4,204,845
430–030	4,204,865
430–306	4,204,866
430–376	4,204,867
430–461	4,204,868
430–564	4,204,869
430–213	4,204,870
430–072	4,205,005
568–451	4,205,013
585–469	4,205,017
525–404	4,205,018
525–243	4,205,019
525–275	4,205,020
525–240	4,205,021
427–004	4,205,059
370–083	4,205,200
370–081	4,205,201
370–081	4,205,202
370–110	4,205,203
235–092 CT	4,205,238
455–620	4,205,268
455–004	4,205,269
455–158	4,205,270
455–083	4,205,272
371–003	4,205,301
371–050	4,205,324
340–147 MD	4,205,325
340–147 R	4,205,326
340–208	4,205,327
340–521	4,205,328
179–100.1 G	4,205,339
357–023	4,205,342

PATENTS

GRANTED MAY 27, 1980

GENERAL AND MECHANICAL

4,204,282

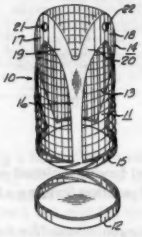
IMPLANTABLE ARTIFICIAL SPHINCTER

Richard A. Bolt, Suite 400 Medical Arts Bldg., 1012 Volusia Ave., Daytona Beach, Fla. 32015

Filed May 8, 1978, Ser. No. 903,825

Int. Cl.[2] A61F *1/00, 1/24*

U.S. Cl. 3—1 **8 Claims**



1. An implantable artificial sphincter comprising a sleeve for supporting the terminal end of a bowel therein, said sleeve having multiple openings therethrough for the passage of anchoring fibrous granulation tissue, one end of said sleeve provided with a removable closure, said sleeve consisting of a sleeve support including a ring member for receiving said closure at said one end and a plurality of struts extending from said ring member generally in the axial direction and a mesh sleeve secured to or integral with said support.

4,204,283

PROSTHETIC VALVE

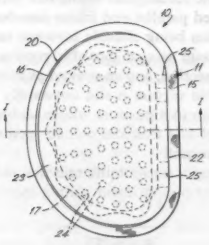
Brian J. Bellhouse, Islip, England, and William G. Williams, Islington, Canada, assignors to National Research Development Corporation, London, England

Filed May 3, 1978, Ser. No. 902,746

Claims priority, application United Kingdom, May 5, 1977, 18895/77

Int. Cl.[2] A61F *1/22*

U.S. Cl. 3—1.5 **11 Claims**



1. A prosthetic valve comprising: an annular member defining a valve seat around an aperture; and an obturating flap having a major area thereof in the form of a rigid sheet with a substantially straight edge portion, and having a minor area thereof in the form of a flexible sheet extending from along the whole length of said edge portion and connecting the flap to said member to serve as a hinge;

said flap being movable about said hinge between positions in which the flap is respectively engaged and disengaged with said seat to close and open said aperture, and said major area being of similar shape and extent to said seat so that the forces acting on said flap, when closed, are transmitted to said annular member predominantly through said rigid sheet.

4,204,284

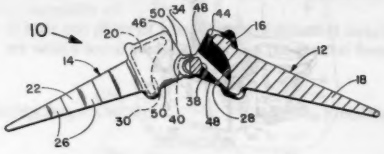
JOINT PROSTHESIS WITH CONTOURED PIN

James B. Koeneman, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Nov. 16, 1977, Ser. No. 852,181

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **12 Claims**



1. A joint prosthesis comprising:

(a) a first relatively inextensible component;

(b) a second relatively inextensible component that is spaced from the first component along a first axis;

(c) means defining a relatively inextensible pivot member disposed between and spaced from each of the first and second components, the pivot member having a central axis which is oriented generally perpendicular to said first axis, the first and second components being disposed entirely on opposite sides of and separated by a plane oriented generally perpendicular to said first axis and generally parallel to said central axis of the pivot member, the pivot member also having, when viewed in section taken normal to said central axis, two discrete arcuate surfaces spaced apart from one another about the circumference of the pivot member and connecting surfaces disposed between said discrete arcuate surfaces, said connecting surfaces being within the generatrix of at least one of said discrete arcuate surfaces; and

(d) means for resiliently securing the pivot member to each of the first and second components, the securing means including (i) a first portion that secures the first component to one of the arcuate surfaces of the pivot member and (ii) a second portion that secures the second component to the other of the arcuate surfaces of the pivot member, each of the first and second portions of the securing means extending about the junctions of said discrete arcuate surfaces and said connecting surfaces and having at least one exposed surface that extends outwardly from adjacent the pivot member, said at least one exposed surface of the first portion of the securing means being spaced from said at least one exposed surface of the second portion of the securing means throughout at least a majority of their respective lengths measured generally radially of said central axis of the pivot member,

the first and second components being coupled to each other only through the pivot member and the first and second portions of the securing means, the relative inextensibility of the first and second components and the pivot member being determined in comparison to the securing means, the first and second portions of the securing means deflecting in torsional shear to accommodate relative rotation between the pivot member and each of the first and second components so that the first and second components can move toward and away from each other in directions generally parallel to said first axis through frotation about a second axis that is disposed at least adja-

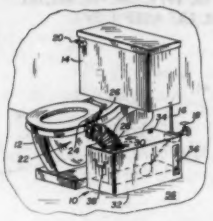
cent to and at least approximately parallel to the central axis of the pivot member.

4,204,285

OVERFLOW PROTECTION APPARATUS

Ian T. Pak, Box 258G, R. D. No. 1 Amwell R.D., Neshanic, N.J. 08853

Filed Jul. 30, 1979, Ser. No. 62,061
Int. Cl.[2] E03D *11/02, 11/18*
U.S. Cl. 4—427 **7 Claims**



1. An overflow protection apparatus for use with a toilet including a bowl and water flushing source operatively coupled together providing a water flow path therebetween and a water input flow path for said flushing source comprising, in combination:

(a) a bowl having an outwardly extending spout with an exit level disposed below the upper surface of said bowl and including an inlet aperture for receiving said water from said flushing source;

(b) an auxiliary reservoir disposed proximate said bowl and being provided with an inlet orifice, said reservoir having a capacity approximately equal to the amount of water provided by said flushing source in one flush; and

(c) flexible coupling means connected between said bowl spout and said reservoir inlet orifice to provide a continuous water flow path.

4,204,286

SPRING SUPPORT

Nathan Stiles, Ashburnham, and Richard T. Heininger, Gardner, both of Mass., assignors to Gem Industries Inc., Gardner, Mass.

Filed Dec. 11, 1978, Ser. No. 968,077
Int. Cl.[2] A47C *17/14*
U.S. Cl. 5—11 **2 Claims**

1. The combination of a bedstead having end posts at the corners thereof, a vertical plate on each post, a series of vertically aligned and spaced hooks on each plate, and a supporting tab at the lower end of each plate, the hooks being narrower than the tab,

with a spring support comprising an angle iron at each end of a spring, each angle iron having two flanges, a shorter recess at each end of one flange and a longer recess at each end of the other flange, the angle irons being selectively positioned on the tabs or on corresponding hooks,

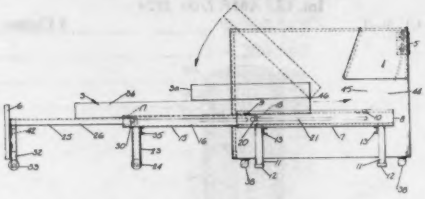
the shorter recesses fitting in the hooks, and the longer recesses including edges resting resting on the tabs.

4,204,287

KNOCK-DOWN SOFA BED WITH HINGED MATTRESS

Manning Lane, 3185 Patrisal Ct., Cincinnati, Ohio 45236; Warren J. Hauck, 8020 Brooks Rd., Harrison, Ohio 45030, and Roy O. Sweeney, 5584 Clearidge La., Cincinnati, Ohio 45239

Filed Sep. 5, 1978, Ser. No. 939,392
Int. Cl.[2] A47C *17/40*
U.S. Cl. 5—18 R **20 Claims**



1. A convertible sofa bed having a closed position forming a seating unit and an opened position forming a bed, said sofa bed comprising:

a self-supporting rectangular frame-like horizontal stationary section having a pair of spaced parallel end frame members, said members supporting a resilient horizontal surface defining a seating platform when said sofa bed is in the closed position;

a plurality of spaced load-bearing legs depending from and attached to the peripheral edge of said stationary section for supporting substantially entirely said section from the floor;

a first movable rectangular frame-like section formed by a pair of spaced parallel end frame members, said first movable section frame members supporting a resilient horizontal surface, said first movable section being slidable between said closed position wherein said first movable section underlies said stationary section, and an opened position wherein said first movable section is slid outwardly from said stationary section to a position where said horizontal resilient surfaces of said stationary and first movable section are substantially co-planar;

first connecting means joining said stationary section and said first movable section to permit linear sliding movement therebetween;

a second movable rectangular frame-like section formed by a pair of spaced parallel end frame members, said second movable section being slidable between said closed position wherein said second movable section underlies said first movable section, and an opened position wherein said second movable section is slid outwardly from said first movable section to a position where said horizontal resilient surfaces of said first and second sections are substantially co-planar; and

second connecting means joining said first and second movable sections to permit linear sliding movement therebetween.

4,204,288

CONVERTIBLE SEAT-BED

Alfred S. Villa, 2511 Domingo Rd., Fullerton, Calif. 92635; Leo Thigpen, Jr., 16655 N. Sycamore St., Orange, Calif. 92667

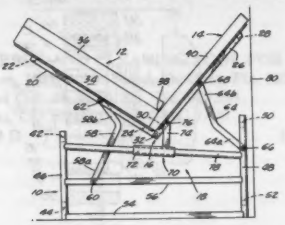
Filed May 26, 1978, Ser. No. 909,918
Int. Cl.[2] A47C *12/17*
U.S. Cl. 5—47 **14 Claims**

1. In a convertible seat-bed, or similar structure, in which a seat and a back are supported on a base and interconnected by articulated actuating means for controlling movement of the seat and back between a seat forming position in which the seat extends generally horizontally and the back extends generally in an upright position, and a bed forming position in which the seat and back extend horizontally in a generally coplanar rela-

tionship, the improvement in which the interconnecting means comprises:

a front swingable link member having a lower end pivoted on said base and an upper end pivoted on said seat;

a rear swingable link member having a lower end pivoted on said base and an upper end pivoted on said back;



means providing a hinged pivot interconnection of said seat and back along adjacent inner sides; and

connection means positioned between said front link member and said back link member including a control member supported on said base for movements in opposite directions, and having a pivot connection with said back rearwardly spaced from said hinged interconnection.

4,204,289

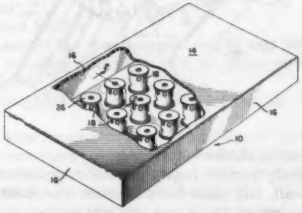
WATERBED MATTRESS

Isaac Fogel, Silver Spring, Md., assignor to Classic Corporation, Jessup, Md.

Filed Apr. 14, 1978, Ser. No. 896,300

Int. Cl.[2] A47C *27/08*

U.S. Cl. 5—451 **7 Claims**



1. A waterbed mattress construction having baffle damper means for substantially eliminating water wave action comprising:

a top sheet and a bottom sheet, said top sheet and said bottom sheet being joined to form a sealed envelope;

a plurality of baffle damper housing means in said waterbed mattress, each of said baffle damper housing means having a pair of spaced, opposed vertical sides affixed to the interior surface of said bottom sheet and having flotation means extending said baffle damper housing means vertically to contact the interior of the top sheet when weight is resting on said top sheet, said baffle damper housing means being positioned in said waterbed mattress to prevent continuous water wave action.

4,204,290

PROCESS FOR THE RAPID, CONTINUOUS NOVEL TEXTURING OR TEXTILE MATERIALS AND NOVEL-TEXTURED TEXTILE MATERIALS

Dara A. Jilla, 5006 Crooked Oak La., Charlotte, N.C. 28211

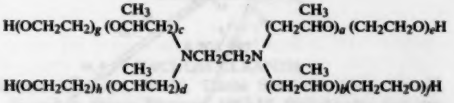
Filed Feb. 27, 1978, Ser. No. 881,665

Int. Cl.[2] D06P *5/08*; D06M *15/10, 15/48*; B32B *27/08*

U.S. Cl. 8—478 **8 Claims**

1. A process for imparting novel, commercially attractive tone-on-tone or heather look to a textile material, comprising impregnating suitable localized zones of substantially dry textile matrial in a precise, controlled manner with an inert solution of polymers at a temperature in the range of 150° to 250° C., said polymers being sufficiently inert as to have no substantial adverse effect upon the textile material undergoing impregnation, said impregnation of localized zones taking place while said textile material is under tensile stress whereas other localized zones of said textile material are not subjected to said impregnation step, quenching said impregnated textile material, rinsing said quenched textile material with a relatively low boiling organic liquid, exposing said rinsed textile material to dry heat at a high temperature sufficient to remove the excess of said organic liquid from the surface of the materials, and then dyeing said textured textile material, said polymers consisting essentially of:

a. at least one phase of a copolymer of dimethyl terephthalate with a tetrol compound having the general formula:



where a, b, c, d, e, f, g, and h are each integers and the total of a, b, c, and d is between 8 and 850 and the total of e, f, g, and h is between 8 and 1,000;

b. at least one phase of a compound which contains a cross-linkable polyester dispersed in a high boiling organic liquid selected from the class consisting of polyethylene and other polyalkylene glycols, and the methyl and ethyl-mono- and di-ethers of such glycols.

4,204,291

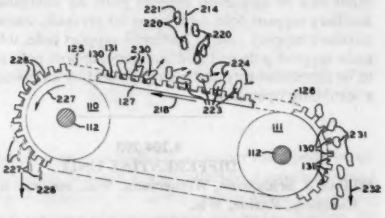
APPARATUS FOR REMOVING MOLD AND OTHER DETRITUS FROM RAISINS AND THE LIKE

Leo Chooljian, 5442 E. Heaton, Fresno, Calif. 93727, and Mehran Chooljian, 805 Lyon, Sanger, Calif. 93657

Filed Feb. 28, 1979, Ser. No. 16,157

Int. Cl.[2] A23N *9/00*

U.S. Cl. 15—3.1 **16 Claims**



1. An apparatus for removing mold and other detritus from raisins and the like comprising:

A. a member having an inclined, generally planar, upwardly disposed surface parallel to a predetermined inclined plane of reference and which has an upper end portion, a lower end portion and pockets therein;

B. means for depositing raisins to be treated on the surface between said portions; and

C. means for moving the member substantially parallel to said reference plane with a compound movement having an oscillatory component alternately toward said opposite end portions and an intermittent component progressive toward said upper end portions, whereby the mold and other detritus are separated from the raisins by the pockets and motivated with the progressive component toward

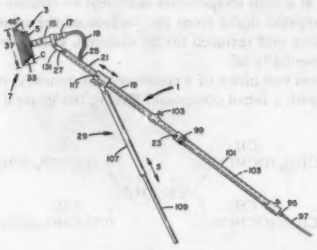
said upper end portion, and the separated raisins gravitate toward said lower end portion.

4,204,292

PORTABLE SCRUBBING TOOL

Frank R. Lester, Boynton Beach, Fla., and James Bullard, Adair, Okla., assignors to Nuvite Chemical Compounds Corporation, Brooklyn, N.Y.

Filed Sep. 21, 1978, Ser. No. 944,354
Int. Cl.[2] A46B *13/02*; A47L *11/162*
U.S. Cl. 15—28 **19 Claims**



1. A lightweight, portable, pneumatic powered scrubbing tool comprising a scrubbing brush member having a substantially circular mounting plate, and a plurality of bristles affixed to one surface of the plate, at least a portion of said bristles affixed to said plate adjacent the periphery thereof and directed at an angle outwardly therefrom, a pneumatic powered motor having a motor drive shaft connected to said plate for rotating said plate, said motor positioned adjacent the other surface of said plate, and of a size so as not to extend beyond the periphery of said plate, an elongated, tubular, main support pole, means for pivotally connecting one end of said main support pole to said motor, a flexible pneumatic fluid supply hose within said main support pole extending from the other end of said main support pole and through an opening defined in a peripheral portion of the main support pole and connected to said motor, said opening located adjacent said one end of the main support pole, a quick-disconnect pneumatic fitting connected to said fluid supply hose, said fitting mounted at the other end of said main support pole, an elongated, tubular, auxiliary support pole, and means for pivotally connecting said auxiliary support pole to said main support pole, whereby said main support pole and said auxiliary support pole are adapted to be simultaneously and manually held by an operator during a scrubbing operation.

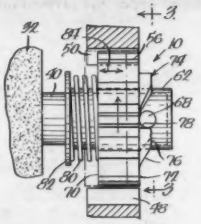
4,204,293

DIFFERENTIAL UNIT

William J. Schlapman, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 924,199, Jul. 13, 1978, abandoned. This application Mar. 12, 1979, Ser. No. 19,933
Int. Cl.[2] E01H *1/04*; F16D *11/04*
U.S. Cl. 15—79 R **11 Claims**

1. A differential unit providing for relative motion between two drive wheels, comprising: a shaft, a pair of gears positioned transversely with respect to said shaft and supported by said shaft, each of said gears having a pair of opposing major faces and being operably connected to one of said drive wheels, ratchet crown means on only one of said major faces of each gear and having camming surfaces for producing axial movement of said gears on said shaft, each of said camming surfaces terminating in an axial surface, the other of said major faces defining a generally flat surface extending radially of said shaft, projecting means protruding radially outwardly from said shaft adjacent to said ratchet crown means and adapted to engage an axial surface to drive said shaft and to engage said camming surface to move said gears axially, abutment means carried by said shaft adjacent to and spaced from each ratchet crown means, and biasing means between said abutment means and said flat surfaces biasing said camming surfaces toward said projection means, whereby differences in speeds of rotation of said gears will produce relative rotation of said shaft with respect to the slower rotating gear and compress said biasing means to produce axial movement of said slower gear with respect to said shaft.

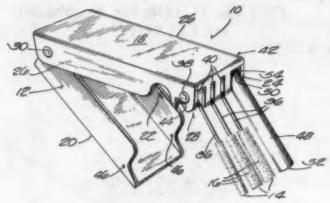


4,204,294

ELECTRICAL TERMINAL CLEANING DEVICE

Robert J. Halverson, 10525 W. Greenfield, Milwaukee, Wis. 53214

Filed Oct. 23, 1978, Ser. No. 953,539
Int. Cl.[2] A46B *7/02*
U.S. Cl. 15—185 **4 Claims**



1. A cleaning device comprising:

a main body member having an interior pocket including an end wall, said main body member also having an open portion permitting access into said interior pocket;

a first shaft adjacently located to said end wall and a second shaft in said interior pocket and spaced from said first shaft;

a plurality of brushes, each of said brushes including an abrasive bristle end, an end portion oppositely spaced from said abrasive bristle end, each of said end portions being individually pivotally attached to said first shaft for permitting independent pivotal movement of said respective brush through said open portion between an inoperative position in which said respective abrasive bristle end is confined within said interior pocket and an operative position in which said respective abrasive bristle end extends outwardly of said main body member, and a stem portion intermediate each of said end portions and said respective abrasive bristle end;

a cover member pivotally mounted on said second shaft for movement between a first position permitting pivotal movement of each of said abrasive bristle ends through said open portion and a second position preventing the pivotal movement; and

wherein said end wall includes a plurality of slotted portions, the number of said slotted portions corresponding with the number of said brushes, each of said slotted portions being aligned with a respective one of said brushes and adapted to receive said respective stem portion when said

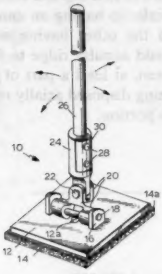
respective brush is moved between said operative and inoperative positions, each of said slotted portions substantially limiting movement of said respective abrasive bristle end in a direction generally parallel to said first shaft when said respective brush is in said operative position.

4,204,295

GROUT SCRUBBER AND CLEANING TOOL FOR TILE

John D. O'Connor, 1817 Robin Hood, Sarasota, Fla. 33581

Filed Oct. 23, 1978, Ser. No. 953,851
Int. Cl.[2] A49L *13/04*; B25G *1/00*
U.S. Cl. 15—209 D **1 Claim**



1. A tile scrubbing and cleaning tool, comprising:
a rigid, flat rectangular plate, said plate having an upper surface and a lower surface;
a pair of flanges connected and integrally formed on the top of said plate, said flanges being parallel and having a pair of apertures, one in each flange, axially aligned for receipt of a shaft;
an elongated handle;
a handle socket for receiving one end of said handle, said socket including a movable joint for planar movement in a first plane;
a shaft connected between said flanges through said apertures;
a second joint member connected movably to said shaft for planar movement perpendicular to said first joint member, said second joint member and said shaft being spaced above the mid portion of said flat plate;
a fibrous pad attachable to the bottom surface of said flat plate, said flat plate including a central aperture for receiving a threaded connector; and
a threaded connector for attaching said pad to said plate, said threaded connector including a tapered head portion at one end, said tapered head having a diminishing diameter toward said threaded connector shaft, and a threaded nut attachable to the opposite end of said threaded connector, said spacing between said second joint and said plate upper surface for allowing access for installation or removal of said threaded connector whereby said pad may be easily installed or removed by separation of said threaded connector from said plate.

4,204,296

FLUID DYNAMIC FURNACE CLEANING SYSTEM

Richard J. Reilly, 1759 Venus Ave., St. Paul, Minn. 55122

Filed May 25, 1978, Ser. No. 909,382
Int. Cl.[2] F23J *3/02*
U.S. Cl. 15—316 R **8 Claims**

1. A fluid dynamic cleaning system for cleaning the inside surface of a furnace comprising in combination:
a cleaning fluid manifold means;
supply means to supply a pressurized cleaning fluid to said manifold means;
a plurality of entrance channels in said furnace, said channels connected to said manifold means so as to receive fluid therefrom; and

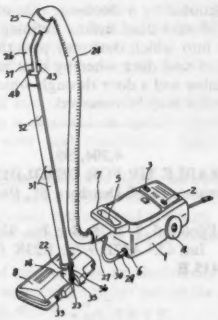
fluid attachment surfaces adjacent the exit ends of said channels on the inside of the furnace operable to direct the flow of fluid.

4,204,297

VACUUM CLEANER

Ryuichi Yasunaga, 250-10, Tatebe Sakai-cho, Yohkaichi-shi, Shiga-ken; Shinya Tsutsumi, 1863-10, Wakaba-cho, 5-chome, Ohmi-hachiman-shi, Shiga-ken, and Mototsugu Kuroda, 205, Tsukamoto, Gokasyo-cho, Kanzaki-gun, Shiga-ken, all of Japan

Filed Jan. 10, 1979, Ser. No. 2,351
Claims priority, application Japan, Jan. 19, 1978, 53-005508[U]; Jan. 19, 1978, 53-005510[U]
Int. Cl.[2] A47L *5/36, 9/26*
U.S. Cl. 15—323 **7 Claims**



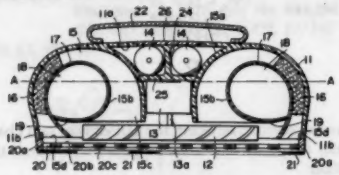
1. A vacuum cleaner comprising a cleaner main body incorporating an electric fan and a dust collector; a nozzle having a rotary brush rotatable by an electric motor and a connecting pipe turnable about a horizontal axis; means for holding the connecting pipe in communication with a suction opening of the main body, the communication means including an extension pipe connected at its one end to the connecting pipe, a flexible hose having a lead wire embedded therein and communicating at its one end with the suction opening, and a bent pipe interconnecting the extension pipe and the flexible hose; a first electrical connector electrically connecting one end of the lead wire to the main body; an electrical cord extending from the nozzle and electrically connected to the other end of the lead wire by a second electrical connector to supply current to the electric motor; a cord cover attached to the bent pipe for rendering the cord coextensive with the bent pipe along the outer surface thereof and covering the second electrical connector; and biasing means mounted on the nozzle for tensioning the cord extending along the outer surface of the extension pipe.

4,204,298

COMPACT VACUUM CLEANER

Hiroyuki Handa, and Tomoko Handa, both c/o Sagami Tsushin Kogyo Kabushiki Kaisha Nai, 4041, 5-chome, Nango Chigasaki-shi, Kanagawa-ken, Japan

Filed Nov. 15, 1978, Ser. No. 960,999
Claims priority, application Japan, Nov. 18, 1977, 52-139159
Int. Cl.[2] A47L 5/24
U.S. Cl. 15—344 17 Claims



1. A vacuum cleaner comprising:

a hollow body member having a closed upper end and an open lower end adapted to be disposed so as to apply an air draft to a surface to be claimed;

driving means disposed in said body member;

means connecting said driving means with a source of energy to drive said driving means;

fan means disposed in said body member and adapted to be driven by said driving means; and

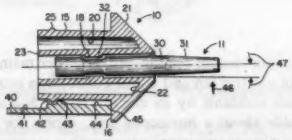
duct means formed in part by said body member and in part by partitions disposed in said body member and adapted to circulate within said body member an air flow generated by said fan means, said duct means having an outlet end adjacent to a suction side of said fan means and an inlet end confronted by a discharge side of said fan means, a portion of said duct means defining a dust collecting chamber into which dust may pass through openings in the wall of said duct whereby dust may be collected in said chamber and a door through which dust collected in said chamber may be removed.

4,204,299

REPLACEABLE TIP FOR DESOLDERING TOOLS

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed Jul. 7, 1978, Ser. No. 922,676
Int. Cl.[2] A47L 9/02; B23K 3/00
U.S. Cl. 15—415 R 8 Claims



1. A replaceable tip assembly for attachment to the forward end of the barrel of a desoldering tool, said assembly comprising:

an end cap adapted to be removably secured to said forward barrel end of a desoldering tool, said end cap having a frustoconical front portion terminated at its small diameter in a front end planar surface substantially normal to the central axis thereof, said end cap having a rear cylindrical portion extending rearwardly from said front frustoconical portion terminating in a rear end planar surface, said end cap having a central bore coaxial with its central axis;

said end cap being formed to include a rearwardly open, cylindrically annular well extending forwardly coaxially with said axis from said rear end planar surface to a point axially near said front frustoconical portion and being closed at its forward end by said frustoconical portion, said well being radially disposed between the outer surface of said rear cylindrical portion of said end cap and its said central bore, said well thereby defining an outer annular rearwardly extending skirt portion of said end cap and an inner cylindrical annular portion, the two portions of said end cap being interconnected only by a radially intermediate, axially short portion of its said front frustoconical portion; and

a nozzle tip disposed in said end cap, said nozzle tip having a generally cylindrical outer surface continuing forwardly in an outer tip portion of reduced outer diameter, said nozzle tip having a central bore extending therethrough,

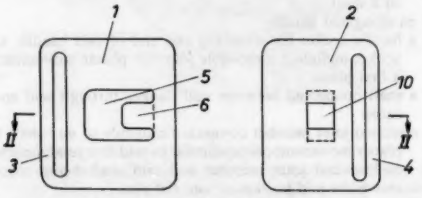
one of said central bore of said cap and said outer cylindrical surface of said nozzle tip having an annular, radially extending ridge and the other having an annular recess cooperating with said annular ridge to form a tight connection therebetween, at least a part of said cooperating ridge and recess being disposed axially rearwardly of said front frustoconical portion.

4,204,300

FASTENER FOR GARMENTS

Gerhard Fildan, Kriehubergasse 31, A-1050 Wien, Österreich, Austria

Filed Jul. 27, 1978, Ser. No. 928,450
Claims priority, application Austria, Jul. 28, 1977, 5526/77
Int. Cl.[2] A44B 17/00
U.S. Cl. 24—201 HE 9 Claims



1. A hook fastener for garments comprising:

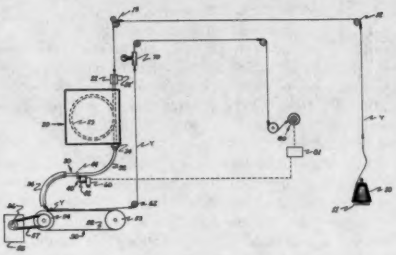
a first substantially platelike member having an arched bridge protruding from a surface of the member, a first aperture formed in the first member in alignment with the protruding portion of the bridge, and a portion of the first member having a predetermined shape for fixing the first member to a garment, the bridge cooperating with the surface of the first member to define an opening extending in a direction in which tension is applied to the fastener; and

a second substantially platelike member having a portion thereof shaped to define a fixing portion for fixing the second member to a garment, and a second aperture formed in the second member with side walls spaced from the fixing portion, the second aperture having a first portion thereof closest to the fixing portion shaped to provide a sufficiently large opening for insertion of said bridge into said second aperture, a second portion of the second aperture being partially blocked by a lug protruding towards the fixing portion from a portion of a side wall of the aperture, the protruding portion being spaced from adjacent side walls so that the lug is insertable into the opening defined by the bridge.

4,204,301
STRAND HANDLING SYSTEM AND METHOD THEREFOR

Donald C. Corron, Piedmont, and Glen Tallent, Jr., Greenville, both of S.C., assignors to Greentex Incorporated, Greenville, S.C.

Filed Apr. 26, 1978, Ser. No. 900,194
Int. Cl.[2] D02G 1/20
U.S. Cl. 28—248 12 Claims



1. An improved yarn strand handling apparatus comprising yarn heat treating means; yarn directing means associated with a strand exit side of said yarn heat treating means for receiving a yarn strand therefrom and directing the strand under substantially tensionless condition in a predetermined pattern; yarn conveyor means located beneath said yarn directing means and having a surface for continuously receiving and accumulating the yarn strand in said predetermined pattern under substantially tensionless condition for cooling; guide means located adjacent the discharge end of said yarn conveyor means for removing the yarn strand from the surface of the yarn conveyor means in a direction generally parallel to said yarn conveyor means surface and generally axially with respect to movement of the accumulated yarn thereon to reduce tendency of the strand to tangle during removal from said conveyor surface; yarn detangling means for receiving the yarn strand from said guide means; and yarn take up means downstream of said yarn detangling means for forming the yarn strand into a package.

11. An improved process for handling heat treated yarn strands comprising the steps of:

(a) continuously passing a yarn strand from heat treating means under generally tensionless conditions to a yarn directing means;

(b) oscillating said yarn directing means over a continuously moving yarn support surface to deposit the yarn strand under generally tensionless conditions thereon;

(c) accumulating the yarn on the moving surface while permitting the yarn to cool under substantially tensionless conditions;

(d) withdrawing the yarn strand from the accumulated yarn on the surface in a direction substantially parallel to the surface and to the direction of movement of the accumulated yarn thereon to reduce tendency of the strand to tangle during removal from said surface;

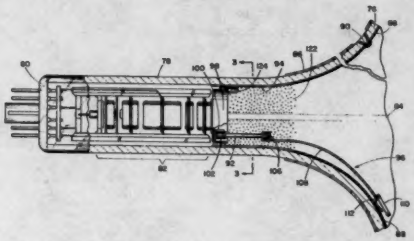
(e) subjecting the moving yarn strand in a confined area to an oppositely directed flow of air under pressure to detangle the same; and

(f) taking up the yarn strand on a package at a speed that is controlled by the amount of yarn on said moving surface.

4,204,302
METHOD FOR TERMINATING AN ELECTRICAL RESISTOR FOR A TELEVISION CRT

Valentijn B. Bing, Des Plaines, and Donald A. Neis, Naperville, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Division of Ser. No. 830,270, Sep. 2, 1977. This application Nov. 22, 1978, Ser. No. 962,820
Int. Cl.[2] H01J 9/24
U.S. Cl. 29—25.13 1 Claim



1. For use in the manufacture of a television CRT electron gun which includes an improved strap-type getter assembly, a method of mounting as part of said getter assembly an elongate cylindrical arc suppression resistor rod of predetermined outside diameter which comprises an insulative cylindrical core having a conductive termination coating on each end, said core being covered by a resistive coating which overlaps a marginal portion of said termination coatings on each end of said rod, said method comprising:

providing an electrically conductive coil spring whose unstressed inside diameter is slightly less than the said outside diameter of said resistor rod;

enlarging the diameter of said spring by imposing a torsional stress thereon;

inserting an end of said resistor rod into the opened spring until said spring is disposed on said termination coating and extending over said overlapped marginal portion thereof;

releasing the spring to permit it to tightly constrict upon said rod and thereby make a sound electrical and mechanical engagement with said rod and said coatings;

similarly applying a second coil to the opposed end of said rod;

welding to one of said springs an electrically conductive getter strap for supporting a getter pan on the distal end of said resistor rod; and

welding to the other of said springs an electrically conductive bracket for supporting said getter assembly on the gun and for serving as an electrical terminal for the getter assembly,

said bracket and said strap mechanically joining a number of turns of the respectively attached spring to prevent said spring from being torsionally stressed open and thereby releasing said rod.

4,204,303
LOCKING MECHANISM FOR MACHINE TOOL HOLDER/ADAPTER

Lane L. P. Eidam, 38 Watergate, South Barrington, Ill. 60010

Filed Dec. 5, 1977, Ser. No. 857,386
Int. Cl.[2] B23B 31/16; B23Q 3/157
U.S. Cl. 29—26 A 12 Claims

1. An automatic machine tool, including:

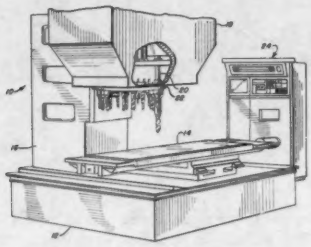
a rotatable and axially movable drive spindle having an end face and spindle nose means extending from the end thereof:

a tool holder/adapter cooperatively associated with said machine tool for selective connection to said spindle nose

means, said tool holder/adapter including a central recess for receiving said nose means and lock pin means for selectively locking said tool holder/adapter to said spindle nose means; and turret means for cooperation with said tool holder/adapter for storing said tool holder/adapter when not in use, the improvement comprising:

said spindle nose means having a small diameter end spaced from said end face of said drive spindle, said nose section tapering from said small diameter end toward said end face and having means defining a circumferential locking groove in the tapered portion of said nose section;

said tool holder/adapter having:



a tapered central recess,

means defining a plurality of substantially radially disposed lock pin passageways, each of said passageway means extending from said central recess to the periphery of said tool holder/adapter;

a plurality of elongated lock pin means, each positioned for reciprocal movement in one of said passageway means and constructed to selectively and lockingly engage said locking groove; and

biasing means for coaction with each of said pin means and said passageway means for directly applying a biasing force to said pin means so as to urge said pin means outwardly and away from said central recess.

4,204,304

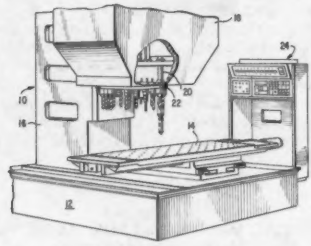
TRAVEL LIMIT STOP PIN

Lane L. P. Eidam, 38 Watergate, South Barrington, Ill. 60010

Filed Mar. 1, 1978, Ser. No. 882,405

Int. Cl.[2] B23B *31/16*; B23Q *3/157*

U.S. Cl. 29—26 A **4 Claims**



1. An axially rotatable tool holder/adapter for use in a machine tool, which is adapted to engage a drive tool spindle in operation and adapted to be stored in a turret associated with a machine tool, wherein the holder/adapter includes:

(a) a body portion having:

(1) means defining a central recess for receiving a drive spindle,

(2) means defining a plurality of substantially radially-disposed, open-ended lock pin passageways, each of which extends between the periphery of the body portion and the central recess means,

(3) means defining a plurality of generally axially arranged travel-limit-stop-pin-receiving bores, each of said bores being at least partially aligned with the central recess means and associated with the inner end of each of said lock pin passageway means,

(b) a plurality of lock pin means, each movable within one of said passageway means so as to extend outwardly from the peripheral end of said passageway means, in a storage position and so as to extend inwardly from the inner end of said passageway means into said central recess in the locked-to-the-spindle position,

(c) retainer means carried by said body portion having peripheral wall means constructed to slidably fit about the periphery of said body portion, said retainer means being biased axially upwardly for movement between a blocking position whereat each lock pin is prevented from moving outwardly from the peripheral end of said passageway means and a retracted position whereat each lock pin can move outwardly thereof; and

(d) a plurality of travel-limit-stop-pin means, each: (i) being positioned in one of said travel-limit-stop-pin bore means; (ii) being biased axially toward said central recess, (iii) being movable between an extended-lock-pin block position and a depressed release position; (iv) having means for blockingly engaging inner end of a locking pin and for preventing camming cooperation between said lock pin means and said stop-pin means, said means being fully aligned with said central recess; and (v) being constructed to be engaged by a descending spindle nose and depressed into said bore means so as to disengage said lock pin and permit inward movement of said lock pin to a spindle locking position, wherein each of said stop pin bore means is fully aligned with said central recess, and said stop-pin means includes shoulder means for cooperation in limiting upward movement of the stop-pin means, and wherein there is further provided flange means within said central recess for cooperation with said stop pin shoulder means for limiting upward movement.

4,204,305

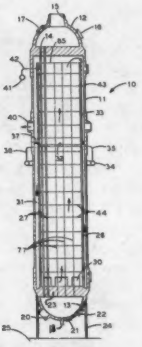
METHOD OF ASSEMBLING A HEAT EXCHANGE APPARATUS

Frank E. Norton, York, Pa., assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 175,600, Aug. 27, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 559,861

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.4 **4 Claims**



1. A method for assembling an heat exchange apparatus comprising the steps of arranging a bundle of tubes in spaced parallel relation for flow of fluid therethrough in indirect heat

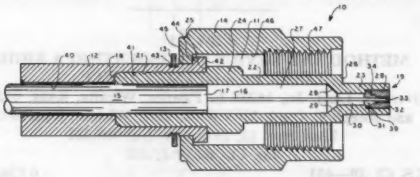
transfer relation with a fluid flowing thereover, enclosing the bundle of tubes within a shroud, providing a tube spacing and support plate for the tube bundle in which the plate is connected to the shroud and extends transversely of the tubes, forming spaced circular holes within the support plate through which the tubes extend, and forming at least three bights in the peripheries of each of said holes to produce in each of the respective holes a continuous surface having a plurality of circumferential arcuate segments spaced from its corresponding tube to provide lateral support of the tube and a gap between the tube and at least one of the segments, and other segments intermediate and connected to and spaced outwardly from the arcuate segments to provide spaces for flow of fluid over the tubes and across the plate, the depths of the bights being determined by the required heat exchanger flow area and structural integrity of the support plate, the deepest portion of each of the bights defining a circle having a diameter which is substantially greater than the outside diameter of the heat exchanger tube lodged therein comprising the further step of chamfering said hole from which said bights are formed.

4,204,306

APPARATUS FOR ALIGNING AND TERMINATING AN OPTICAL FIBER WITHIN A FIBER OPTIC CONNECTOR

John A. Makuch, Danbury, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 7, 1977, Ser. No. 849,055
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.5 **14 Claims**



1. An apparatus for locating an optical fiber within an opening in the terminal end of a fiber optic connector along a preselected axis, comprising:

jig means formed from compressible material, said jig means having an indexing portion including a first opening dimensioned for receiving the terminal end of said connector and an aligning portion including a second opening dimensioned for receiving the optical fiber, said second opening being dimensioned smaller than said first opening; and

means for applying a uniform compressive force to said jig means, said force applying means causing said indexing portion of said jig means to grip the terminal end of said connector and causing said aligning portion of said jig means to grip the optical fiber, said aligning portion locating the optical fiber along said preselected axis.

4,204,307

ARROW FLETCHING METHOD

Rodger E. Pfetzing, 1700 Melton, Birmingham, Mich. 48008

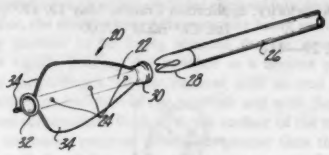
Filed Jun. 26, 1978, Ser. No. 919,429
Int. Cl.[2] B23Q *17/00*; B23P *17/00, 11/02*
U.S. Cl. 29—407 **3 Claims**

1. A method for fletching arrows comprising the steps of:

molding a unitary fletching device so as to form a hollow cylindrical body with radial vanes and being adapted to fit snugly over the rearward end of an arrow shaft by virtue of said hollow cylindrical body being formed with an internal diameter slightly smaller than the external diameter of said arrow shaft and having forward and rearward ends; and forward and rearward integral concentric annular forms;

gripping the forward annular form and pulling it and the fletching device onto the arrow shaft;

concurrently gripping the rearward annular form and pushing it and the fletching device onto the arrow shaft; and



thereafter removing the forward and rearward annular forms by severing them from the cylindrical body.

4,204,308

SCREW EXTRACTING DEVICE

Douglas S. Marling, 2511 Elizabeth St., Janesville, Wis. 53545

Filed Aug. 1, 1978, Ser. No. 929,899
Int. Cl.[2] B23P *19/02*; B25B *13/50*
U.S. Cl. 29—426.5 **7 Claims**

7. A method of extracting a screw the head of which is substantially flush with or lies below the surface into which the screw extends, utilizing a device comprising an elongate rod threaded along a portion of a length thereof; a handle located at one end of said rod; a plurality of elongate, longitudinally tapered gripping fingers located at the other end of said rod including a plurality of gripping ridges on inwardly facing side surfaces of each of said fingers along the length thereof for gripping the screw to be extracted; and a sleeve member, threaded for movement along said rod, for controlling opening and closing of said gripping fingers in accordance with the longitudinal position of said sleeve member along said rod, said method comprising:

applying an impact force to the said one end of said device so as to drive said elongate, longitudinally tapered gripping fingers into said surface in a direction substantially perpendicular to said surface and to a depth such that ridges on said inwardly facing side surfaces of said fingers, will engage the screw when said fingers are closed;

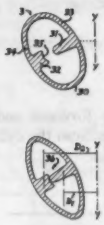
screwing said sleeve member onto said rod in a direction towards said gripping fingers so as to provide closing of said gripping fingers about the head of the screw; and

rotating said device to cause unscrewing of the screw.

4,204,309
PROCESS OF FABRICATING HOLLOW BEAD RINGS

Jean Lefrancois, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed May 9, 1978, Ser. No. 904,294
Claims priority, application France, May 13, 1977, 77 15008
Int. Cl.[2] B23P 17/00
U.S. Cl. 29—412 11 Claims



1. Process of fabricating a hollow bead ring for a bead of a pneumatic tire, said hollow bead ring having a radial cross-section with at least one interior partition which connects together two portions of the outer contour, characterized by the fact that it comprises the following operations:

(a) extruding, by means of an extruder whose orifice is equipped with a single mandrel, a hollow member whose interior partition is connected to a single one of said portions, the other end of the interior partition being free,

(b) deforming, in one or more steps, the radial cross-section of the hollow member until the free end of the interior partition comes into contact with the other portion of the outer contour,

(c) cutting the hollow member into suitable length,

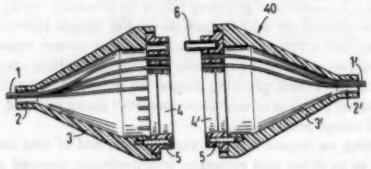
(d) bending the hollow member to the desired diameter, and

(e) connecting the ends of the bent hollow member together by welding; said operations (c), (d) and (e) being performed either before or after said deforming operation (b).

4,204,310
PROCESS FOR PRODUCING A DEVICE FOR COUPLING TWO LIGHT CONDUCTING FIBER CABLES

Franz Auracher; Karl-Heinz Zeitler, and Walter Rauscher, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 688,716, May 21, 1976, Pat. No. 4,111,522. This application Feb. 28, 1978, Ser. No. 882,261
Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522740
Int. Cl.[2] B23P 9/00
U.S. Cl. 29—445 6 Claims



1. A method of producing a device for coupling light conducting fiber cables together, said device having a single holder for the fibers of the cables, said method comprising providing a blank for a guide body for the holder, supporting the blank with a surface lying in a flat plane, forming guide channels in the surface of the blank to form a guide body having one surface with channels extending inward therefrom, each channel having an undercut profile with the width adjacent the bottom of each channel being greater than the width at the one surface, inserting the light conducting fibers of each cable into their respective channels with the end faces of the fibers of one cable in contact with the end faces of the fiber of the other cable, and applying a cover member on the guide body to form the holder.

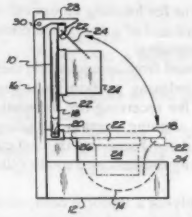
5. A method for producing a device for coupling two light conducting fiber cables together, said device having a separate holder for each cable secured in a housing, said method comprising providing a blank for a guide body for each holder, supporting each blank with a surface lying in a flat plane, forming guide channels in the surface of the blank to form a guide body having one surface with channels extending inward therefrom by forming each guide channel with an undercut profile with the width of the channel at the bottom of each channel being greater than the width of the channel at said one surface, subsequently inserting light conducting fibers in the channels of each of the guide bodies with the end faces of the fibers adjacent one end surface of the guide body, applying a cover member on each guide body to secure the fibers in said channels to form each holder, grinding and polishing the end surface of each holder and the end faces of the fibers so that the end faces of the light conducting fibers lie in the plane of the end surface, and securing the holders in a housing with the fibers of one cable being centered relative to the fibers of the other cable.

6. A method according to claim 5, which includes forming a chamfered portion on the guide body and cover adjacent each end of each channel.

4,204,311
METHOD AND DEVICE FOR INSERTING A RIGID LINER IN A HELMET SHELL

Elvert H. Land, Jr., 16205 E. Pawnee, Wichita, Kans. 67230, and Joseph E. Land, 2303 White Oak, Wichita, Kans. 67207

Filed Nov. 13, 1978, Ser. No. 960,222
Int. Cl.[2] B23P 11/02
U.S. Cl. 29—451 6 Claims



1. A device for inserting a rigid liner in a helmet shell comprising:

a base having a bowl-shaped recess that supports the helmet shell in an inverted position;

an upright rising from and fixed to the base;

a frame movably mounted on the upright so that it can be moved toward or away from the base and extending, when in its lower position, along each side of and just above the helmet shell when the shell is seated in the recess in the base;

a pair of slip sheets of smooth, flexible material so located and of a size to cover the interior side walls of the helmet shell for easing the insertion of the rigid liner; and

means for fastening the slip sheets to the frame so that they are held to the frame during the insertion of the liner and also during withdrawal of the slip sheets from between the liner and the shell after the assembly has been made.

6. A method of inserting a rigid liner in a helmet shell comprising:

placing the inverted helmet shell in a bowl-shaped recess;

lowering a frame toward the helmet shell to the frame's lower position just above and adjacent to the front and sides of the helmet shell;

fastening smooth, flexible slip sheets to hang from the underside of the frame and extend downward to shroud the interior walls of the helmet shell;

inserting the rigid liner by shoving it down into the helmet shell eased by the slip sheets;

adjusting the rigid liner to its proper position in the helmet shell;

raising the frame to its upper position where the assembled helmet is clear of the recess;

latching the frame in the upper position; and

pulling the assembled helmet from the frame leaving the slip sheets fastened to the frame where they are ready for reuse without repeating the fastening step.

4,204,312

METHOD AND APPARATUS FOR JOINING A TUBULAR ELEMENT TO A SUPPORT

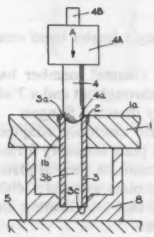
Philip G. Tooker, Snitterfield Nr. Stratford-upon-Avon, England, assignor to Serck Industries Limited, England

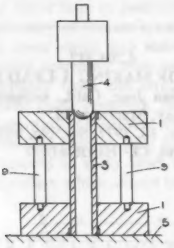
Filed Jan. 31, 1978, Ser. No. 873,887

Claims priority, application United Kingdom, Feb. 11, 1977, 5868/77

Int. Cl.[2] B21D *39/00*; B23P *11/00, 11/02*

U.S. Cl. 29—523 **12 Claims**





1. A method of securing a tubular element into an aperture in a member, the dimensions of the aperture being sufficient to allow the tubular element to be freely inserted therein, comprising the steps of freely inserting the tubular element into said member aperture with the end of the element being substantially flush with the surface of the member, bringing an ultrasonic vibratory tool, of maximum transverse dimension slightly greater than the internal maximum transverse dimension of the bore of the element, into axial alignment with the bore, no part of the tool having larger cross-sectional dimensions than the cross-sectional dimensions of said aperture, bringing the tool into contact with the element whilst the tool is not vibrating ultrasonically, supporting the element axially and applying axial force to the tool whilst vibrating it ultrasonically so as to move it into the bore and expand the element outwardly against the wall of said aperture without substantially moving the element axially, the axial force applied to the tool being insufficient in magnitude to substantially deform the element were the tool not vibrated ultrasonically, and withdrawing the tool from the element while continuing to vibrate it ultrasonically.

10. Apparatus for securing a tubular element into an aperture in a member, the dimensions of the aperture being sufficient to allow the element to be freely inserted therein, comprising means for rigidly holding the member in a desired position, means for supporting a tubular element with an end portion thereof within an aperture of the member and with the end of the element substantially flush with the surface of the member, a tool of maximum external dimension greater than the maximum internal dimension of the element, no part of the tool having larger cross-sectional dimensions than the cross-sectional dimensions of the aperture, means for vibrating the tool ultrasonically after the tool has been brought into contact with the element, means for applying a force to the tool in a direction longitudinally of the element without substantially moving the element axially, the force applied to the tool being insufficient in magnitude to substantially deform the element were the tool not vibrated ultrasonically, abutment means for engagement by the element to provide a reaction to said force during application of the tool to the element to expand the latter, and means for discontinuing ultrasonic vibration of the tool after the element has been expanded and the tool has been withdrawn therefrom.

4,204,313

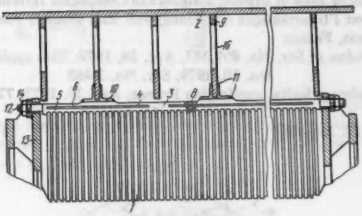
METHOD OF ASSEMBLING STATOR CORE OF ELECTRIC MACHINE INSIDE THE HOUSING THEREOF

Garri M. Khutoretsky, Altaiskaya ulitsa, 20, kv. 5; Vladimir M. Fridman, Grazhdansky prospekt, 13, korpus 1, kv. 170; Galina A. Zagorodnaya, Altaiskaya ulitsa, 20, kv. 5; Alexandr I. Vorontsov, Pushkin, ulitsa Khazova, 43, kv. 94; Anatoly D. Ignatiev, ulitsa Basseinaya, 85, kv. 162, and Vasily L. Sudarikov, ulitsa Bela Kuna, 13, kv. 32, all of Leningrad, U.S.S.R.

Filed Apr. 30, 1979, Ser. No. 34,385

Int. Cl.[2] H02K *15/14*

U.S. Cl. 29—596 **2 Claims**



1. A method of assembling a stator core, having stator core segments, of an electric machine, supported in a housing by means of resilient coupling ribs having resilient portions and core supporting portions, comprising the following steps:

urging said resilient portions of said resilient coupling ribs towards said core supporting portions up to a state of elastic deformation by means of detachable clamping members;

securing said coupling ribs to said housing with said resilient portions;

assembling stator core segments on said core supporting portions of said resilient coupling ribs;

compressing said core segments;

securing said core segments to said resilient coupling ribs, said core segments being under compression; and

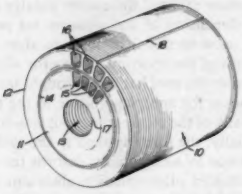
removing said detachable clamping members from said resilient coupling ribs;

whereby a tight fit of the core on said resilient coupling ribs during operation of the electric machine is retained.

4,204,314
METHOD OF MAKING CAST WINDINGS FOR ELECTRIC MOTORS

John Workman, Greyabbey, Northern Ireland, assignor to S.B.W. Engineers Limited, Belfast, Northern Ireland

Filed Nov. 14, 1977, Ser. No. 851,268
Int. Cl.[2] H02K *15/02*
U.S. Cl. 29—597 7 Claims

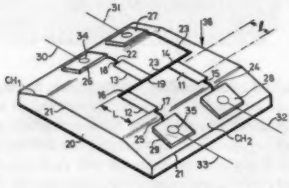


1. A method of manufacturing an electromagnetic device having a core made of laminated material with a double-layer winding therein, wherein the core is composed of first and second sets of apertured laminations of which one set accommodates the conductors of one layer of said winding and the other set accommodates the conductors of the other layer of said winding, the conductors of said one layer being interconnected with the conductors of said other layer by end windings located at the end faces of said core, wherein said method includes the steps of displacing adjacent laminations in each lamination set from mutual alignment to permit conductor ends which are to be interconnected to adjoin one another, locating said conductors in the slots formed by said lamination apertures, and casting the end windings in situ.

4,204,315
METHOD OF PRODUCING A MAGNETIC TRANSDUCER DEVICE

Jean-Pierre Lazzari, Montfort-l'Amaury, and Michel Helle, Marcq, both of France, assignors to Compagnie Internationale Pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Division of Ser. No. 899,383, Apr. 24, 1978. This application Jan. 10, 1979, Ser. No. 2,465
Claims priority, application France, Apr. 29, 1977, 77 13026
Int. Cl.[2] G11B *5/42*
U.S. Cl. 29—603 4 Claims



1. A method of producing a magnetic transducer comprising:

depositing a first layer of electrically insulating material on one surface of an electrically insulating substrate;

depositing magnetoresistive detecting and compensating elements on the layer of electrically insulating material;

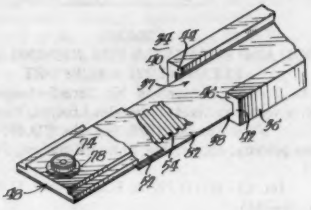
beveling opposite surface portions of the surface of the substrate on which the layer and elements are deposited, selectively depositing a layer of conductive material to form connections between the magnetoresistive detecting and compensating elements, and such that said connections terminate on the bevels to form large contact areas;

attaching flexible wires to the contact areas and depositing a second protective layer of electrically insulating material on the substrate, the magnetoresistive compensating and detecting elements, and their connections.

4,204,316
METHOD OF MANUFACTURE OF A HEATER BAND

Matt N. Hummel, Glenview, Ill., assignor to Acra Electric Corporation, Schiller Park, Ill.

Filed Aug. 3, 1978, Ser. No. 930,684
Int. Cl.[2] H01C *3/18*
U.S. Cl. 29—61 N 12 Claims



1. A method of making a heater band comprising the steps of:

forming an extruded channel member having a relatively thick cross-section throughout and a T-shaped slot therein defined by inwardly directed flanges;

forming a heater plate assembly adapted to be received within the slot, said plate assembly formed by securing an electric heating element to a metal plate;

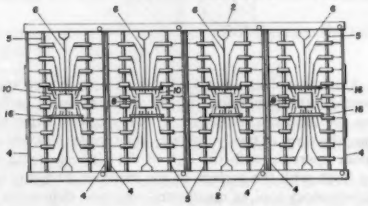
combining said heater plate assembly with said slot of said channel member so that said heating element is retained within said slot; and

compressing said heater plate assembly and said channel member to provide intimate contact between said heater plate assembly and said channel to thereby form the heater band.

4,204,317
METHOD OF MAKING A LEAD FRAME

Clarence W. Winn, San Jose, Calif., assignor to The Arnold Engineering Company, Marengo, Ill.

Filed Nov. 18, 1977, Ser. No. 852,765
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—827 7 Claims



1. The method of making a lead frame comprising the sequential steps of:

providing a metal strip;

providing from said strip a lead frame blank having a die attach pad and a plurality of leads attached to said pad in spaced apart relationship and extending therefrom to other parts of said blank;

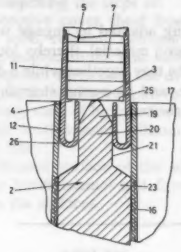
plating said lead frame blank;
applying retainer means to said leads adjacent said pad in spaced, noncontiguous relation to the latter for holding the leads in position when they are separated from said attach pad; and
subsequently separating said leads from said attach pad.

4,204,318

APPARATUS FOR RETRACTING THE STATOR COIL OF AN ELECTRIC MOTOR

Manfred Kirbis, Harrislee; Peter Schilde, Flensburg, and Gert Englmaier, Harrislee, all of Fed. Rep. of Germany, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jul. 12, 1978, Ser. No. 923,821
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1977, 2732477
Int. Cl.[2] H02K *15/06, 15/10*
U.S. Cl. 29—734 **2 Claims**



1. Apparatus for installing stator coils in an electric motor of the type in which the coil grooves are each lined with groove insulation which projects beyond the end face of the stator in the form of a turned over collar, comprising a base member, a plurality of circumferentially arranged coil strand guide members extending upwardly from said base member for extending through a stator bore for radial abutting engagement with surface portions of said bore between said grooves, a head member in guiding engagement with said guide members for passing through a stator bore to push coil strands into stator coil grooves, a plurality of circumferentially arranged guide rods for pushing cover strips into stator coil grooves, said guide rods extending upwardly from said base member and being radially outward from and circumferentially aligned with said coil strand guide members, said guide rods having portions for axial abutting engagement with surface portions of said stator between said grooves, said guide rod end portions being generally tapered to splay apart adjacent turned over groove insulation collars which extend beyond the end face of the stator.

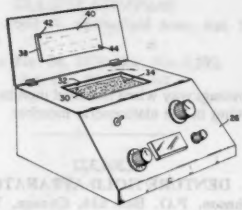
4,204,319

TERMINAL PIN INSERTION DEVICE

Jack Bishop, 4729 Sara Dr., Torrance, Calif. 90503

Continuation-in-part of Ser. No. 794,012, May 5, 1977, abandoned. This application May 30, 1978, Ser. No. 910,276
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—739 **13 Claims**

1. A system for inserting terminal pins in selected locations in a circuit board comprising:
a movable pin assembly plate having a plurality of predetermined pin locators,
each of said pin locators having a central opening for accepting a terminal pin and having a depth to support said pin in a vertical position,
a fixed plate located above said movable pin assembly plate having a plurality of openings cooperating with each of said pin locators whereby movement of said pin assembly plate inserts each of said pin locators through each of said openings in said fixed plate,
said fixed plate having guard portions for holding a plurality of loose terminal pins on the uppermost portion of the fixed plate,
a vibrating device connected to said fixed plate for selectively vibrating said fixed plate whereby a loose terminal pin falls through each of said openings in the fixed plate



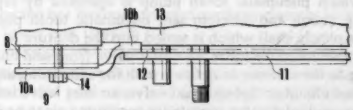
and into the pin locators cooperating with each opening, and
a movable backup plate for holding a circuit board facing said fixed plate and in a unique relationship with respect to said pin assembly plate whereby moving said backup plate and said pin assembly plate towards each other causes terminal pins in each pin locator to be inserted in the terminal board.

4,204,320

SPROCKET SHAFT STAY

Youichi Hayashimoto, Hiroshima, Japan, assignor to Shindaiwa Kogyo Co., Ltd, Hiroshima, Japan

Filed Dec. 18, 1978, Ser. No. 970,873
Claims priority, application Japan, Aug. 18, 1978, 53/114035[U]; Sep. 28, 1978, 53/119728[U]
Int. Cl.[2] B27B *17/02*
U.S. Cl. 30—386 **3 Claims**



1. A sprocket shaft stay comprising a sprocket holder secured to a sprocket by bolting and a leg piece extending from said sprocket holder and fixed in position between the chain saw cover and saw chain guide.

4,204,321

DENTAL POST

Edward S. Scott, 1818 S. Cincinnati, Tulsa, Okla. 74119

Filed Mar. 24, 1978, Ser. No. 889,723
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—177 **8 Claims**

1. A dental post for removably securing a denture to the mandible, the denture apparatus having therein a recess defined in part by an elastomeric member having an opening therethrough, the dental post comprising
a body portion having a first stem for permanent attachment to the mandible; and
a second stem portion extending from said body portion in the plane of and exterior of the gingival or gum of the mouth, the second stem portion having an enlarged outer head member dimensioned to be received through a denture apparatus elastomeric member by compression of the elastomeric member whereby the elastomeric member

applies retentive force to the head member, the head member having a groove in the exterior surface providing

a fluid passageway when the head member passes through the opening in the elastomeric member.

4,204,322

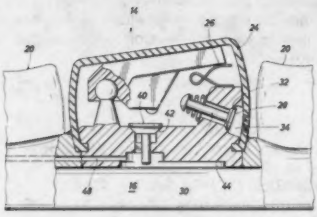
DENTURE HOLD APPARATUS

John N. Johnson, P.O. Box 614, Orange, Tex. 77630, and Charles J. Lindenberger, 508 S. Gardenia Dr., Melbourne, Fla. 32901

Filed Mar. 3, 1978, Ser. No. 882,989

Int. Cl.[2] A61C *13/24*

U.S. Cl. 433—185 **9 Claims**



1. A pneumatic holding apparatus for use in a denture which comprises a pneumatic tooth pump installed in the denture plate which pneumatic tooth pump is operated by repeated chewing action and wherein said pneumatic tooth pump includes a plastic shell which is sealed into the denture to define an internal closed chamber, an outlet valve from said chamber opening to the exterior to define a path for exhausting air from the closed chamber through said valve, an inlet valve into said chamber, said inlet valve repeatedly permitting air to be drawn into said chamber from an indention formed by a peripherally surrounding flange which flange contacts the gum thereby enclosing said indentation so that air pulled from the indention adjacent the gum of the user forms a partial vacuum holding the denture plate more firmly to the gum of the user as the user chews and the chewing motion repeatedly collapses said plastic shell to repeatedly expel air through the outlet valve.

4,204,323

DENTAL IMPRESSION TRAY

Hans D. Neubert, Anaheim; Larry R. Dailey, Fountain Valley, and Richard S. Robinson, Anaheim, all of Calif., assignors to NDR Associates, Anaheim Hills, Calif.

Filed Sep. 19, 1977, Ser. No. 834,568

Int. Cl.[2] A61C *9/00*

U.S. Cl. 433—38 **9 Claims**

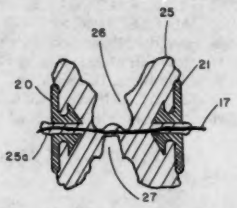
1. An integral dental impression tray formed from a plastic injection molding process comprising:

a. spaced-apart buccal and lingual retaining walls defining opposed wall portions;

b. a plurality of recesses disposed on the opposed wall portions;

c. a spacing member for connecting the buccal and lingual walls, the tray defining a central longitudinal plane of symmetry through the spacing member and centrally through both walls, and the recesses defining central longitudinal axes disposed about orthogonally to the symmetry plane and outwardly therefrom; and,

d. central slits disposed medially along the buccal and lingual walls, the plane of symmetry passing through each slit, to secure a flexible sheet support for obtaining a dental impression thereon;



the recesses being adapted to engage with beads of the dental impression material, thereby locking the flexible support and the tray together while a dental impression is being made, and to permit stripping of the flexible support from the tray.

4,204,324

GUM MASK

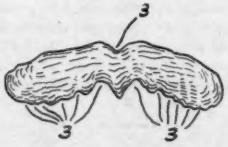
Karl Köstner, In der Römerstadt 89, 6000 Frankfurt, Fed. Rep. of Germany, and Aldo Lufi, Kaspar - Wüststr. 26, CH 8052 Zürich, Switzerland

Filed Oct. 4, 1977, Ser. No. 839,204

Claims priority, application Switzerland, Oct. 4, 1976, 012511/76

Int. Cl.[2] A61C *13/00*

U.S. Cl. 433—299 **17 Claims**



1. A gum mask for covering the necks of teeth exposed by gum atrophy, characterized by an oval, elongated and slightly arched shape adapted to the original form of the atrophied gums and stretching to the crowns of the teeth, said mask made from an inert elastomeric material having a front side having a surface structure and color that simulates the natural gums and a reverse side adapted to be mounted on said teeth, one longitudinal edge of said mask having an indentation (3) in a region adapted to contact the frenulum, the opposite longitudinal edge of said mask having several indentations (3), the number of which corresponds to the number of tooth necks to be covered, said reverse side of said mask which is adapted to contact the gums having ridges (4) along said opposite longitudinal edge between the indentations, said ridges being adapted to closely embrace the exposed necks (2) and roots of the teeth.

4,204,325

ORTHODONTIC BRACKET BONDING SYSTEM

David H. Kaelble, Thousand Oaks, Calif., assignor to Arroyo Research and Consulting Company, La Canada, Calif.

Filed May 12, 1978, Ser. No. 905,198
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—9 11 Claims

1. A method of adhering orthodontic brackets to the surface of tooth enamel comprising the steps of:

removing a protective cover sheet from the surface of a patch of dry, solid, resilient, continuous film of organic resin adhesive secured to the rear surface of the bracket;

activating the exposed surface of the dry adhesive film by applying a liquid activating reagent to the surface to produce a temporary state of high tack capable of aggressive bonding to the tooth enamel without affecting the rear surface of the film;

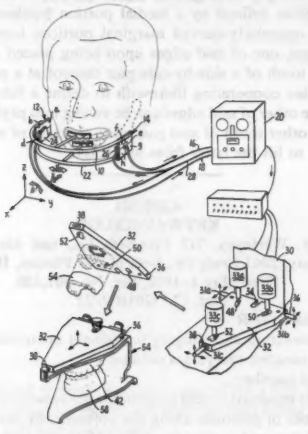
applying the activated surface of the adhesive film to the surface of the tooth enamel and forming an interfacial bond between the surfaces.

4,204,326

DEVICE FOR RECORDING AND REPRODUCING MANDIBULAR MOTION

John Dimeff, 5346 Greenside Dr., San Jose, Calif. 95127

Filed Dec. 4, 1978, Ser. No. 965,749
Int. Cl.[2] A61C *11/00, 9/00*
U.S. Cl. 433—50 9 Claims



8. Dental apparatus for mechanically recording the mandibular and occlusal signatures of a patient, comprising

transducer means connected between the patient's mandible and the cranial structure for producing separate electrical signals representative of relative motion at selected locations between the mandible and the cranium along and about three orthogonal axes; the transducer means being initially aligned with the hinge axis of the patient's mandible,

a machinable plate for mounting a maxillary cast of teeth,

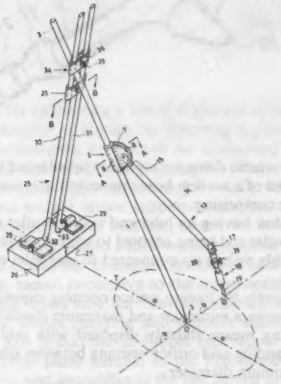
servo-controlled cutting tool means for cutting pathways in the plate, the servo-controlled cutting tool being connected to the transducer means and controlled by the electrical signals produced thereby so as to cut pathways in the plate having configurations which are representative of the relative motion at selected locations between the patient's mandible and the cranium.

4,204,327

ELLIPSE COMPASS

Naguib F. Danial, 2503 W. Springfield Ave., Apt. E-3, Champaign, Ill. 61820

Filed Jan. 24, 1979, Ser. No. 6,182
Int. Cl.[2] B43L *11/04*
U.S. Cl. 33—30 F 1 Claim



1. A compass for mechanically drawing an ellipse of predetermined major and minor axes comprising:

(a) a guide rod having a lower end defining a point for location at the intersection of the major and minor axes of an ellipse to be drawn,

(b) a tracing bar having a pointed marking element located at the lower end thereof,

(c) connection means for pivotally attaching the upper end of said tracing bar adjacent said guide rod intermediate the ends of said guide rod, said tracing bar connection means being adapted to allow said tracing bar to be pivoted away from said guide rod to releaseably position said point of said marking element at a fixed distance from said point of said guide rod, measured in the drawing plane along the minor axis of the ellipse to be drawn, equal to the semi-minor axis of said ellipse, and said tracing bar connection means being adapted to allow said pivoted upper end of said tracing bar to rotate at a fixed distance about and slide parallel to the axis of said guide rod, and

(d) means for supporting the upper end of said guide rod to releaseably fix the axis of said guide rod, in the plane intersecting the major axis of said ellipse and perpendicular to the drawing plane, at an angle to the drawing plane such that said point of said marking element may be positioned, in the drawing plane, at a distance from said point of said guide rod equal to the semi-major axis of said ellipse by rotation of said tracing bar about said guide rod,

said support means for said upper end of said guide rod comprising a pair of parallel rod elements, apaced apart to receive therebetween said upper end of said guide rod, said rod elements being mounted, for parallel rotational movement, about bends in the feet thereof which feet are positioned within brackets fixed on a base support, said rod pair having positioned thereon a pair of band elements, laterally spaced apart to receive therebetween said upper end of said guide rod said pair of band elements

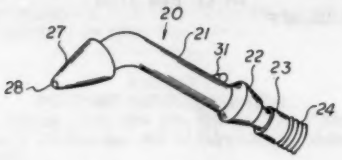
being mounted around and adapted for slideable engagement along said rod pair, each of said band elements having a locking means to allow said band elements to be releaseably fixed in position along said rod pair to adjust said guide rod at the desired angle to the drawing plane.

4,204,328

VARIABLE DIAMETER ASPIRATING TIP

Barry S. Kutner, 8 Crossland Rd., Norwalk, Conn. 06851

Filed Nov. 14, 1977, Ser. No. 851,109
Int. Cl.[2] A61C *17/04*
U.S. Cl. 433—29 **16 Claims**



1. A variable diameter aspirator tip adapted to be connected to the end of a suction hose connected to a source of negative pressure comprising,

a conduit having an inlet end and an outlet end,

said outlet end being adapted to connected to a suction hose,

a flexible nozzle tip connected to said inlet end of said conduit,

said nozzle tip having orifice opening capable of expanding between a minimum and maximum diameter,

a sliding means slidably disposed with said nozzle tip for expanding said orifice opening between said minimum and maximum diameter,

and an actuator connected to said sliding means for shifting said sliding means relative to said nozzle for expanding said orifice opening accordingly,

wherein said sliding means comprises a ring slidably disposed within said nozzle, said ring having a diameter substantially equal to the maximum diameter orifice opening:

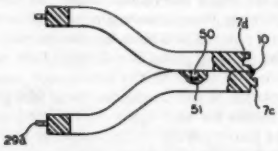
and said actuator being connected to said ring for slidably displacing said ring relative to said nozzle whereby the displacement of said ring relative to said flexible nozzle causes said orifice to expand between a minimum and maximum diameter.

4,204,329

RUBBER DAM HOLDER FOR USE DURING ENDODONTIC THERAPY

Henry Kahn, 1724 Grand Bahama West, Palm Springs, Calif. 92262, assignor to Henry Kahn, Palm Springs, Calif.

Filed Oct. 16, 1978, Ser. No. 951,346
Int. Cl.[2] A61C *5/12*
U.S. Cl. 433—136 **8 Claims**



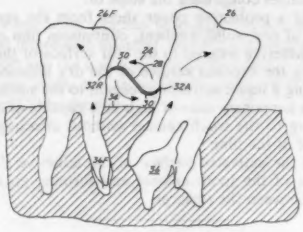
1. A frame for supporting an elastomeric web exterior of the oral cavity of a patient during endodontic therapy, said frame comprising two counter-facing L-shaped parts hinged together to define a U-shaped frame, the hinge being positioned in the center of the base of said U-shaped frame, the pivotal axis of said hinge being essentially perpendicular to the planes of the occlusal surfaces of the patient's teeth, the base of the U-shape frame having a convex configuration to place each of the upright members of said frame substantially parallel to the respective cheeks of the patient, a plurality of hook-like elements on the frame to be engaged by the web, the said two parts of the base of said U-shape frame carrying respective male and female detent elements adapted to engage each other when said frame is folded about said hinge axis.

4,204,330

METHOD AND APPARATUS FOR EXTRACTING TEETH

James P. Ford, Jr., 101 Canary La., Grand Junction, Colo. 81501

Filed Apr. 27, 1978, Ser. No. 900,750
Int. Cl.[2] A61C *3/10, 3/14*; B25B *15/00*
U.S. Cl. 433—148 **6 Claims**



1. In a dental elevator, the improved bit which comprises an elongate rigid member terminating in a blade of a thickness sized for insertion into the gap between a pair of teeth in side-by-side relation, said blade having a width in excess of the width of said gap and a generally S-shaped or reverse S-shaped cross section defined by a medial portion bordered on both sides by oppositely-curved marginal portions terminating in knife edges, one of said edges upon being placed against the adjacent tooth of a side-by-side pair thereof at a point above the gumline cooperating therewith to define a fulcrum about which the other of said edges can be swung into prying contact with the other tooth of said pair upon rotation of said bit in a direction to lift the latter from its socket.

4,204,331

KEYWAY GAUGE

Stanley A. Wertepny, 715 Elizabeth Ln., and Alexander W. Wertepny, 2063 Craig Dr., both of Des Plaines, Ill. 60018

Filed May 1, 1978, Ser. No. 901,320
Int. Cl.[2] G01B *3/22*
U.S. Cl. 33—172 R **11 Claims**

1. A measuring and gauging instrument comprising:

a base member carrying a column;

an anvil member;

a carrier mounted to said column for movement to an infinite number of positions along the column and having means for fixing said carrier in a selected one of said positions;

means for releasably mounting said anvil member to said carrier so that said anvil member extends outwardly therefrom;

said carrier has a socket formed therein adapted to receive an end of said anvil member;

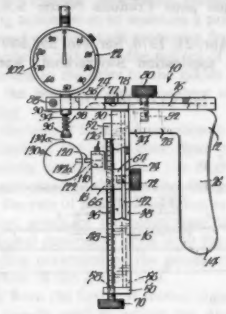
said socket has a square cross-sectional configuration and has sides angularly oriented 45 degrees from the axis of the column;

support means carried by said base member;

means for mounting said support means along an axis transverse to the axis of the column;

indicator means carried by said support means and having a probe extending toward said anvil member; and

a dial connected with said probe for providing visual identification of the amount of movement of said probe, whereby a workpiece positioned on said anvil member is engaged by said probe for measuring a selected dimension of the workpiece.



4,204,332

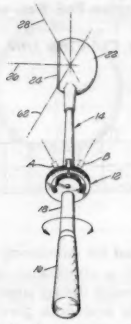
GOLF AID

Lewis L. Gray, 27255 Joppe Ave., Hemet, Calif. 92343

Filed Jul. 31, 1978, Ser. No. 929,818

Int. Cl.[2] A63B *69/36, 53/00*

U.S. Cl. 33—174 F **2 Claims**



1. A golf aid formed of a disc mounted on a golf club shaft in a plane perpendicular to said shaft for correcting the drive angle of a golf ball comprising;

means for securing said golf aid to the shaft of said golf club;

said disc including a generally planar indicator means having a scale thereon; said golf aid being mounted on said golf club shaft intermediate the club handle and the club driving head, and in a plane generally perpendicular to the axis of said shaft, said shaft extending through a portion of said planar indicator means;

pointer means movable in said plane and positioned adjacent to the scale for providing an indication of the amount of drive angle to be corrected; and

means for manually moving the pointer means.

4,204,333

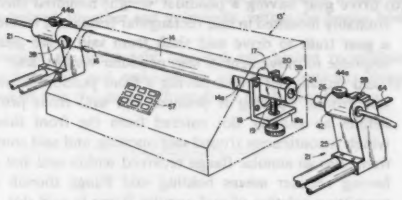
SYSTEM AND METHOD FOR CALIBRATING WHEEL ALIGNMENT SYSTEM SENSORS

Victor B. van Blerk, San Jose, Calif., assignor to Nortron Corporation, Sunnyvale, Calif.

Filed Sep. 15, 1978, Ser. No. 942,874

Int. Cl.[2] G01B *7/315, 19/295, 11/275*

U.S. Cl. 33—288 **6 Claims**



1. In a system for calibrating a wheel alignment system of a type having a plurality of sensors for detecting a plurality of types of input information to be used for computing adjustments to be made to a vehicle for aligning the wheels thereof comprising an elongate rigid bar, means for readily releasably coupling first and second sensor support assemblies to pivot co-axially of opposite ends of said bar, means for moving an end of said bar between raised and lowered positions relative to the other end of said bar to dispose the axis of said bar in a horizontal plane, means responsive to the movements of said bar for indicating when said bar has been moved into said horizontal plane, means carrying said support assemblies to pivot about the axis of said bar to dispose said support assemblies in a horizontal plane parallel to the first named plane, means for locking said assemblies in the last named horizontal plane, means for indicating the disposition of said support assemblies in said last named horizontal plane, means for providing a predetermined information reference representing a predetermined position of said sensors and means for detecting the difference between the information detected by said sensors when in said horizontal plane and a predetermined reference representing a predetermined position of said sensor to provide a correction factor to be associated with said sensors when used to align the wheels of a vehicle.

4,204,334

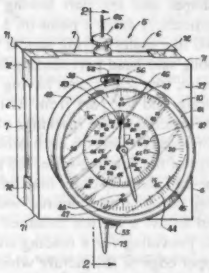
PRECISION GRAVITY RESPONSIVE ANGLE INDICATOR

Luis B. Dela Cruz, 5325 Bonita Dr., San Diego, Calif. 92114

Filed Oct. 6, 1978, Ser. No. 949,125

Int. Cl.[2] G01C *9/12*

U.S. Cl. 33—391 **7 Claims**



1. An angle indicator comprising:

(a) a hollow rectangular frame defining planar orthogonal

outer walls, an interior cavity, and a frontal circular opening providing access to said cavity;

(b) an annular frame rotatably mounted to said rectangular frame over said frontal opening and mounting an annular scale display;

(c) a first shaft rotatably mounted in said rectangular frame coaxial with the rotational axis of said annular frame and having a first needle registering with said scale display;

(d) drive gear having a pendular weight mounted thereon rotatably mounted in said rectangular frame and including a gear train to drive said shaft from said drive gear in response to movement of said pendular weight; and

(e) said rectangular frame having a front portion in which said frontal opening is defined, and said front portion defines an annular slot entered from the front thereof which is continuous around said opening, and said annular frame has an annular flange received within said slot and having retainer means holding said flange therein and permitting rotation of said annular frame in said slot.

4,204,335

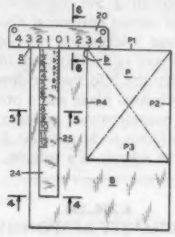
INSTRUMENT FOR POSITIONING PICTURES ON A MOUNTING BOARD

Morris G. Grossman, Wyckoff; Edward D. Levy, Franklin Lakes, and Edward H. Meisner, Wyckoff, all of N.J., assignors to Falcon Safety Products, Inc., Mountainside, N.J.

Continuation of Ser. No. 814,544, Jul. 11, 1977, abandoned. This application Jun. 28, 1979, Ser. No. 52,737

Int. Cl.[2] G01B *3/10*

U.S. Cl. 33—476 **7 Claims**



1. An instrument for positioning a picture on a mounting board or support by taking readings from said instrument and physically sliding said picture along said instrument, said instrument comprising head and leg parts joined together in substantially T-shape, said leg part having a straight edge extending perpendicularly from a point on a straight edge of the head part, two like scales having similar divisional markings extending along said head part reading in opposite directions from said point, two scales each having divisional markings extending along said leg part from its intersection with said head part, the spacing of the markings of the second leg-scale being proportionally closer to each other than the spacing of the markings of the first leg-scale, the proportion being determined by one-half the ratio other than unity of the desired width of the upper border to the desired width of the lower border, above and below a picture mounted on the support, said first leg-scale providing for a reading to be taken of the location of the upper edge of the picture when the lower edge of the picture is aligned with the lower edge of the support, said second leg-scale providing for location of said upper edge of the picture when said upper edge is positioned at the marking of said second leg-scale equivalent to said taken reading.

4,204,336

MICROWAVE FREEZE DRYING METHOD AND APPARATUS

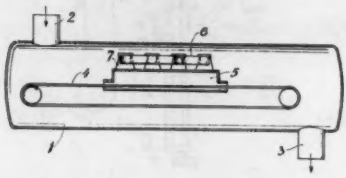
Toai Le Viet, Corseaux, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Apr. 21, 1978, Ser. No. 898,660

Claims priority, application Switzerland, Apr. 27, 1977, 5206/77

Int. Cl.[2] F26B *5/06*

U.S. Cl. 34—5 **3 Claims**



1. In the freeze-drying of a product which employs apparatus including a source of microwave energy and a support disposed below said source and upon which said product is received, the steps of providing said support as a two-layer component, absorbing microwave energy and conducting electricity in the upper one of said layers, and transmitting energy through the lower one of said layers.

4,204,337

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING THE DRYING PROFILE IN A CONTINUOUS-OPERATION MULTI-ZONE DRIER

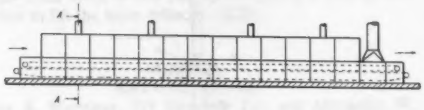
Friedrich Roos, Hauneck, and Friedrich Bahner, Rotenburg, both of Fed. Rep. of Germany, assignors to Babcock-BSH Aktiengesellschaft vormals Büttner-Schilde-Haas AG, Krefeld, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 906,847

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721965

Int. Cl.[2] F26B *3/04*

U.S. Cl. 34—31 **11 Claims**



1. An improved method for monitoring and controlling the drying-action profile of a continuous-operation multi-zone drier comprised of successive drying zones through which are transported plyboards or analogous goods of varying initial moisture content and presenting to the drier a varying degree of surface-area loading,

the continuous-operation multi-zone drier being of the type in which drying gas is circulated in each drying zone in the direction transverse to the transport direction of the goods,

the drying action being adjustable by adjusting the value of the drying-gas temperature in the drying zones and by adjusting the transport speed of goods transported through the multi-zone drier,

the rate of heat consumption in the initial zones of the drier varying mainly as a function of variations in the degree of surface-area loading presented to the drier by the goods and only secondarily as a function of variations in the initial moisture content of the goods,

the rate of heat consumption in the subsequent zones of the

drier varying as a function of both variations in the degree of surface-area loading presented to the drier by the goods and also as a function of variations in the initial moisture content of the goods,

the improved method comprising automatically adjusting the drying action so as to maintain a predetermined moisture content of the goods emerging from the multi-zone drier despite variations in the degree of surface-area loading presented to the drier by the goods and despite variations in the initial moisture content of the goods, this comprising

measuring the rate of heat consumption in at least one of the initial zones of the multi-zone drier to develop a first signal mainly dependent upon the degree of surface-area loading presented to the drier by the goods;

measuring the rate of heat consumption in at least one of the subsequent zones of the multi-zone drier to develop a second signal dependent upon both the degree of surface-area loading presented by the goods and the initial moisture content of the goods; and

developing from the first and second signals in combination control signals used to adjust the drying action of the multi-zone drier.

4,204,338

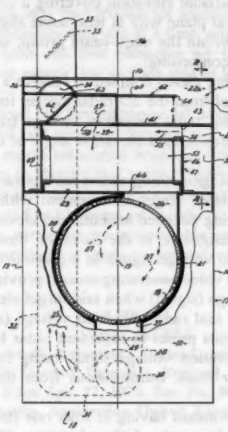
LAUNDRY DRYER

Norman J. Bullock, Prospect, Ky., assignor to The W. M. Cissell Manufacturing Company, Louisville, Ky.

Filed Oct. 2, 1978, Ser. No. 947,943

Int. Cl.² F26B *11/04*

U.S. Cl. 34—35 **8 Claims**



1. A method of heating recirculated exhaust air and fresh make-up air in a laundry dryer, said method comprising the steps of

dividing an attic chamber of said laundry dryer into upper and lower subchambers separated by an intermediate floor, the upper subchamber defining a preheat chamber for recirculating exhaust air,

positioning a heater housing within the lower subchamber, the heater housing extending between the base floor and the intermediate floor, at least a portion of the heater housing's side walls being spaced inwardly from the attic chamber's side walls to define a preheat chamber for the fresh make-up air, the heater housing including heat source means to heat fresh make-up air and recirculated exhaust air together and simultaneously to an elevated temperature level,

recirculating exhaust air into the upper subchamber, and directing make-up air into the lower subchamber, for preheating the recirculated exhaust air and the fresh make-up air to above the temperature at which each entered the respective subchambers,

directing the make-up air into the heater housing in generally horizontal flow path fashion from the lower subchamber, and directing the recirculated exhaust air into the heater housing in generally vertically downward flow path fashion from the upper subchamber, the generally vertical recirculated exhaust air flow and generally horizontal make-up air flow being simultaneously heated and admixed, together and intimately, within the heater housing, and

directing the intimately admixed and heated recirculated exhaust air and make-up air generally vertically downward into the dryer's drum from the heater housing.

4,204,339

TUMBLER WASHING AND DRYING MACHINE

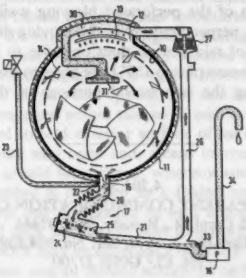
Franz Muller, Troisdorf, Fed. Rep. of Germany, assignor to August Lepper, Maschinen-U. Apparatebau GmbH, Bad Honnef, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,041

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806873

Int. Cl.² F26B *21/08*

U.S. Cl. 34—75 **8 Claims**

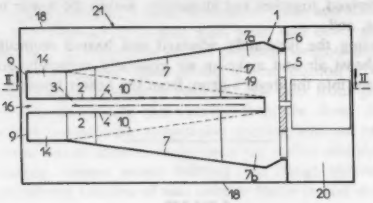


1. A drum-type tumbler drying machine comprising a casing having an upper and lower part, a tumbler drum rotatably mounted within said casing, a radiant heater mounted in the upper part of said casing, said heater including a reflector which serves to effect direct radiation of said tumbler drum, a recirculated air duct which connects with a drain opening at the lower part of the casing and includes an impeller, said air duct extending over the reflector and opening into a nozzle positioned in the charging opening of said drum so that said nozzle supplies recirculated air into the interior of the drum, said air duct further including a condenser supplied with cooling water, said recirculated air duct being connected to said drain opening by way of said condenser, said condenser comprising turbulation means for creating an area of turbulent air flow, a tranquillizing duct located downstream from said turbulation means, spray means positioned upstream from said turbulation means for supplying cooling water, said tranquillizing duct extending at a slight downward inclination with respect to said turbulation means, said tranquillizing duct further including a drainage sump located at a lower level than said tranquillizing duct, a waste water pump and a recirculating air duct for carrying recirculating air to said impeller, said recirculating air duct being connected to said tranquillizing duct at or adjacent the lower end thereof and in advance of the drainage sump.

4,204,340
INSTALLATION FOR TREATING A PRODUCT IN A GASEOUS MEDIUM

Guy Doucin, Thann, and Paul Marchal, Garches, both of France, assignors to Air Industrie, Courbevoie, France

Filed May 4, 1978, Ser. No. 902,959
Claims priority, application France, May 18, 1977, 77 15381
Int. Cl.[2] F26B *13/02*
U.S. Cl. 34—225 13 Claims

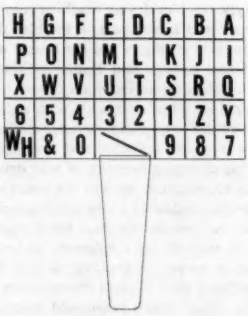


1. An installation for treating a moving strip product in a gaseous medium, particularly for heating and/or drying of said strip, comprising at least one blowing box provided with a perforated blowing wall in front of which the strip moves, said perforated blowing wall comprising, along the moving direction of the strip, a first lateral portion, a central portion and a second lateral portion, said blowing box being supplied with a treatment gas by at least one fan disposed on one side of said blowing box, said fan feeding a central duct supplying the central portion of the perforated blowing wall, said central duct extending perpendicularly to the moving direction of the strip, the end of said central duct opposite to the fan being connected by means of two 180° knee pipes to two blind lateral ducts supplying the two lateral portions of the perforated blowing wall.

4,204,341
TRANSPARENT COMMUNICATION CHART

Paul Nowak, 75 Carol St., Ramsey, N.J. 07446

Filed Jan. 5, 1979, Ser. No. 958,838
Int. Cl.[2] G09B *21/00*
U.S. Cl. 35—1 1 Claim



1. A hand held transparent card imprinted with letters and numbers on a grid comprising:

a transparent plastic rectangular card,

a handle attached to the said card,

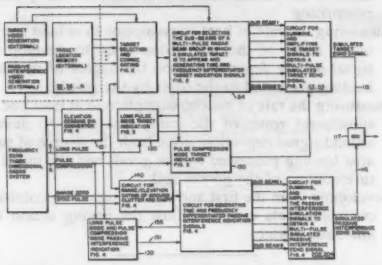
a five by eight grid of squares imprinted on the card,

the numerals, the alphabet, a slash mark and several abbreviated symbols being sequentially imprinted in the center of the said squares.

4,204,342
ELEVATION SIMULATION FOR FREQUENCY SCAN THREE DIMENSIONAL RADAR

Wayne S. Linfield, Sparks, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1979, Ser. No. 40
Int. Cl.[2] G01S *7/40*
U.S. Cl. 35—10.4 14 Claims



1. A system for simulating a predetermined environment in the elevation dimension for a frequency scan (inertialess) 3D radar system; the frequency scan 3D radar system scans in the elevation dimension by means of a series of directable, radar pencil-beams of progressively variable elevation, each of the beams commencing with a different initial frequency which is progressively altered to produce a group of discrete sub beams of progressively variable elevation covering a corresponding sector of the vertical plane with at least some angular overlap of the sub beams within the multi-beam group; said elevation simulation system comprising:

a. elevation sensing means coupled to receive a radar elevation code signal from the 3D radar system for generating a corresponding radar elevation voltage (signal) representing the instantaneous elevation angle of the transmitted radar beam;

b. simulated video generating means incorporating a predetermined simulated target environment with each simulated target being assigned azimuth and elevation coordinates, being designated in the elevation dimension by a target elevation voltage signal; in a given azimuth plane, (said simulated video generating means) providing a target elevation voltage (signal) when said target elevation voltage signal and said radar elevation voltage (signal) compare within limits preset to represent radar beam width; said target elevation voltage signal being synchronized with the radar beam transmissions from the 3D radar system;

c. beam selection means having at least one (target indication) channel for each of the elevation differentiated, angularly overlapping sub beams of a respective radar beam for comparing the radar elevation voltage signal with a respective target elevation voltage signal to obtain an indication of target elevation position within the sector defined by the corresponding radar beam and providing a simulated target indication pulse for each corresponding one of the group of sub beams in which said respective simulated target is to appear in accordance with the degree of sub beam angular overlap;

d. target/sub beam differentiating means responsive to the simulated target indication pulses (signals) to provide a corresponding number of beam differentiated target signals progressively time and frequency differentiated to correlate with the respective transmission frequencies and times of the corresponding sub beams; and

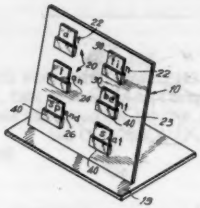
e. target simulation interface means for transmitting to said 3D radar system the beam differentiated target signals such that a simulated target is indicated.

4,204,343

READING SKILLS DEVELOPMENT KIT

Cecilia H. Brooks, 215 W. 88th St., New York, N.Y. 10024

Filed Sep. 25, 1975, Ser. No. 616,594
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—73 5 Claims



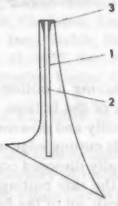
1. A reading skills development kit comprising:
(a) a background;
(b) at least one permanent first phoneme set fixedly disposed on said background, being at least one phoneme and forming a portion of a word;
(c) a different series of elements providing interchangeable second phoneme sets associated with each of said at least one first phoneme sets, each second phoneme set being at least one phoneme and forming an intelligible word with said at least one first phoneme set;
(d) means on said background for selectively exposing said second phoneme sets, one at a time, adjacent their associated at least one first phoneme set to create different intelligible words that include said at least one first phoneme set;
(e) said at least one first phoneme set having the same sound in each of said words so formed; and
(f) coding means associated with said first and second phoneme sets to identify that series of interchangeable second phoneme sets singularly associated with said at least one permanent first phoneme set to indicate erroneous association of a particular interchangeable second phoneme set with a particular at least one permanent first phoneme set.

4,204,344

SHOE HEELS

John V. Cornwell, Leicester, England, assignor to Cornwell Components Limited, Leicester, England

Filed Apr. 27, 1978, Ser. No. 900,749
Claims priority, application United Kingdom, Feb. 2, 1978, 4255/78
Int. Cl.[2] A43B *21/00*; A43D *33/00*
U.S. Cl. 36—34 A 8 Claims



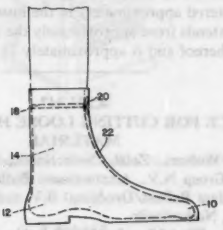
1. A heel for a shoe comprising a moulding of plastics material, a steel reinforcement member integrally moulded longitudinally therein, an aperture for a pin of a top piece formed in the member, and a cavity surrounding the top or shoe remote end of the reinforcement member to allow for the expansion of the reinforcement by the pin of a top piece.

4,204,345

SOCK

Virginia R. Bradley, 3444 Huntington Terrace, Crete, Ill. 60417

Continuation-in-part of Ser. No. 726,680, Sep. 27, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,286
Int. Cl.[2] A43B *3/26, 3/10*
U.S. Cl. 36—97 7 Claims



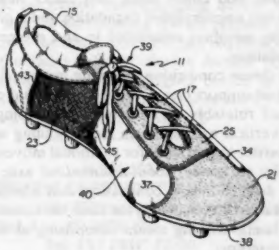
1. A tubular sock for use in combination with a boot, comprising a unitary liquid impermeable sock member having a tubular seamless configuration and a closed end, one open end, said open end having a rim portion, the rim portion including means for securing said sock about the leg of a user, means to adjust the length of said sock by disposing said closed end in a foreshortened condition wherein said closed end is disposed overlapping a portion of said sock member adjacent said closed end when said closed end is in said foreshortened condition, said means for for adjusting the length including a first pad and a second pad, said first pad fixedly secured to the exterior surface of said sock adjacent at a region thereof disposed adjacent the toes of the user and opposite the sole thereof when the user's foot is engaged within said sock, said second pad being fixedly secured to said exterior surface of said sock adjacent the end opposite said open end, means to removably secure said first pad to said second pad, whereby said closed end of said sock member is disposed in a folded up configuration when said first pad is engaged to said second pad thereby disposing said sock member in said foreshortened condition, wherein said sock may be alternately disposed in contact with an inside surface and an outside surface of said boot.

4,204,346

TRAINING SHOE FOR SOCCER

Albert L. Fugere, 4901-17th Ave., S., Seattle, Wash. 98108

Filed Jan. 23, 1978, Ser. No. 871,177
Int. Cl.[2] A43B *5/00, 23/00*
U.S. Cl. 36—114 2 Claims



1. A soccer training shoe, comprising:
a shoe suitable for use in playing soccer, wherein a first area located in the toe region of the shoe and a second area, which is separate from said first area, located in the instep sidewall region of the shoe, are visually distinctive from, and contrast with, the remainder of the shoe by color,

wherein said first area is centered approximately about the longitudinal centerline of the shoe and has a top edge which is located approximately at the base of the eyelet strip of the shoe and a bottom edge which is located at the sole of the shoe and two lateral edges which extend between said top and bottom edges, said top edge being approximately 2 inches long and said bottom edge being approximately 5 inches long, and wherein said second area is centered approximately in the instep region of the shoe and extends from approximately the top of the shoe to the sole thereof and is approximately 2½ inches wide.

4,204,347

DEVICE FOR CUTTING LOOSE HARD GROUND MATERIAL

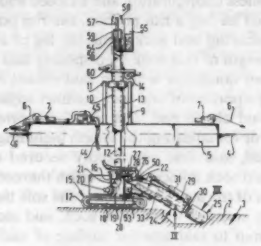
Tjako A. Wolters, Zeist, Netherlands, assignor to Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast/Dredging) B.V. and Banegbo B.V., Amstelveen, Netherlands

Filed Mar. 8, 1978, Ser. No. 884,708

Claims priority, application Netherlands, Mar. 8, 1977, 7702503

Int. Cl.² E02F *3/90*

U.S. Cl. 37—67 **15 Claims**



1. A device for fragmenting hard ground located below water, comprising in combination:

a buoyant body and at least one work support means for supporting part of the weight of said body by bearing against hard ground beneath said body, said work support means comprising an upright work pile and a ground-engaging support at the lower end of such pile;

a carrier and tie means connecting said carrier at one end to said work support means for allowing the opposite end of the carrier to sweep an arcuate path centered on a vertical axis at least closely adjacent said work pile;

a cutter head rotatably carried by said carrier and projecting beyond said opposite end thereof and driving means for rotating said cutter head, said cutter head including at least one uninterrupted foundation and a plurality of rigid cutting members connected to and projecting from said foundation;

said tie means comprising clamping means releasably engaging said support means for anchoring said carrier thereto, a stool rotatably carried by said clamping means about said vertical axis, and arm means joining said one end of the carrier to said stool for rotational movement therewith and for movement about a horizontal axis;

lateral driving means connecting said clamping means to said carrier for swinging the latter about said vertical axis, said lateral driving means comprising at least one linear hydro-motor;

vertical driving means connecting said clamping means to said carrier for swinging the latter about said horizontal axis, said vertical driving means comprising at least one linear hydro-motor; and

which means on said body for raising and lowering said carrier and said tie means bodily as a unit.

4,204,348

RIPPER ATTACHMENT FOR EARTH-WORKING EQUIPMENT

Phillip E. C. Lydie, 2288 Foothill Dr., Vista, Calif. 92083

Filed Oct. 10, 1978, Ser. No. 949,869

Int. Cl.² E02F *3/76*

U.S. Cl. 37—117.5 **7 Claims**

1. A ripper tool for use with earth-working equipment, said tool comprising:

first and second downwardly extending teeth attached to said shank in an approximately inverted "Y" shaped relationship;

said first and second teeth having chisel tips with edges approximately perpendicular to the planes of said teeth and adapted to lie approximately parallel to the ground when in use;

each tooth lying at an equal angle to said shank;

the angle between said teeth being from about 30° to 62°;

whereby said earth-working equipment may be operated to bring said teeth into forceful contact with the ground at an angle between teeth and ground of from about 20° to 90° so that said tool may rock slightly about the shank permitting each tooth to alternately and cyclically dig deeper into the ground.

4,204,349

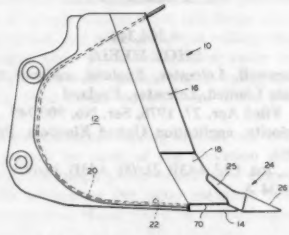
CORNER TOOTH CONSTRUCTION

Thomas J. Tallis, Dowagiac, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 22, 1978, Ser. No. 972,551

Int. Cl.² E02F *9/28*

U.S. Cl. 37—141 RS **5 Claims**



1. A loader bucket having a bottom wall, a cutting edge member along the front of the bottom wall, the cutting edge member having a forwardly and downwardly extending bevel surface, a side wall, a side cutting edge member along the front of the side wall, a vertically disposed corner member coplanar with the side wall and the side cutting edge member and of greater thickness than both, all of the foregoing welded into a unitary structure, and a downwardly and forwardly extending corner tooth shank forming an integral part of the loader bucket, the said tooth shank abutting on the bevel surface of the cutting edge member and also abutting the forward edge of the corner member, said tooth shank having an enlarged portion thicker than the corner member near the front extremity of

the cutting edge member, said tooth shank having a tapered portion extending upwardly and rearwardly from said enlarged portion whereby both the inner and outer surfaces of the tooth shank blend smoothly with the contiguous inner and outer surfaces of the corner member, and the said tooth shank welded to the corner member along both said inner and outer contiguous surfaces.

4,204,350

MOUNTING FOR PHOTOGRAPHS OR THE LIKE

Abner Brenner, 7204 Pomander La., Chevy Chase, Md. 20015

Filed Mar. 30, 1976, Ser. No. 671,767
Int. Cl.² G09F *1/12*
U.S. Cl. 40—155 **4 Claims**

1. A mounting for photographs, posters, prints and textiles comprising:

two transparent plastic sheets in face-to-face relation between which said photograph, poster, print, textile or other item to be mounted is received;

means for clamping said sheets together under pressure, said clamping means consisting of four channel pieces each consisting of a web from which two legs extend at right angles to define a rectangular channel disposed so as to engage the periphery of both of said plastic sheets each of said channel pieces extending along the entire length of the sides of said sheets so as to extend around the entire perimeter of said sheets; and each of said channel pieces having mitered ends, to abut the channel pieces at each of its ends, and each of said channel pieces having at least two threaded apertures in one of said legs; and

forcing screws received in said threaded apertures in said channel pieces and adapted to apply pressure to said sheets, when screwed into said aperture, said sheets each being of sufficient thickness and rigidity to transmit compressive force to the item to be mounted and thus hold it in whatever position it has been placed between said transparent plastic sheets, and said channel being of such a width that when said sheets are pressed together by said forcing screws, a clearance is formed between one of said legs and the sheet nearest to said leg.

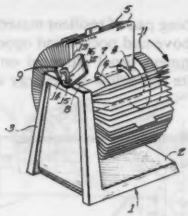
4,204,351

ROTARY CARD INDEX SYSTEM

Graham S. W. Hawkins, Coulsdon, England, assignor to Business Efficiency Aids, Inc., Skokie, Ill.

Filed Aug. 11, 1977, Ser. No. 823,835
Claims priority, application United Kingdom, Aug. 18, 1976, 34369/76
Int. Cl.² G09F *11/04*
U.S. Cl. 40—372 **13 Claims**

1. A rotary card index system comprising rotatable drum means for carrying a plurality of radially extending cards and for causing said cards to rotate therewith in either a clockwise or counterclockwise direction, support means for said drum means, a member movable along a plane generally parallel to the axis of rotation of said drum means to and from an operable position between adjacent cards on said drum means for maintaining a space between said adjacent cards and a retracted position and means mounting said member on said support means for bodily movement about compound axes between said operable and retracted positions responsive to the rotation



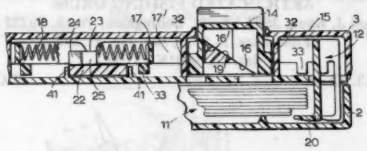
of said cards in either said clockwise or counterclockwise directions.

4,204,352

INDEX-SELECTOR DEVICES

Malcolm Laughton, Birmingham, and Sidney H. Robinson, Redditch, both of England, assignors to Laughton & Sons Limited, Birmingham, England

Filed Mar. 15, 1978, Ser. No. 886,683
Int. Cl.² B42F *17/20*
U.S. Cl. 40—389 **13 Claims**



1. An index selector device of the kind comprising a base and a lid, a hinge connecting the lid to the base, a stack of index cards which are separably mounted between the base and the lid, the cards being hinged at their edges adjacent to the lid hinge, a lid-releasing device normally holding the lid closed against the base, manualy operable selector means which when actuated operates the lid-releasing device to release the lid and raises all the cards in the stack above the one required for use wherein the selector means comprises a plurality of push buttons and a plurality of card-engaging devices mounted in the lid, the push buttons being distributed over an upper surface of the lid, each push button being associated with a respective one of the card-engaging devices and with a lid-releasing device, the arrangement being such that on depression of a selected push button the associated card-engaging device moves to engage a card and the lid-releasing device releases the lid so that all the cards in the stack above the one required are raised with the lid, the index selector device further comprising means for retaining each card-engaging device in its card-engaging position while the lid is open and means for disengaging said retaining means on closing the lid.

4,204,353

FIREARM CARTRIDGE RECEIVER

Raymond O. Isola, 1071 Killmaster Dr., Oscoda, Mich. 48750

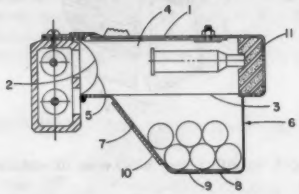
Filed Apr. 10, 1978, Ser. No. 895,097
Int. Cl.² F41C *27/00*
U.S. Cl. 42—1 T **2 Claims**

1. In an improved firearm cartridge retriever for retrieving cartridges and cases ejected from a firearm comprising a rigid housing adapted to be mounted on a firearm and having an opening in register with a cartridge ejection port of said firearm, a mounting device for mounting the cartridge retriever, a

locking device for maintaining the retriever on the firearm, and a pocket for holding ejected cartridges, said pocket being completely foldable into the housing, the improvements which comprise:

an energy absorbing pad of resilient material mounted inside the housing above said pocket and opposite said opening,

a cartridge alignment panel mounted on a portion of the pocket opposite and below the energy absorbing pad and



holding that portion of the pocket rigidly in a downward direction sloping away from said opening when the pocket is in its unfolded condition, whereby cartridges or cases bouncing from said pad are forced into alignment by the sloping pocket portion, and

a rigid bottom panel mounted on the bottom portion of said pocket to additionally assist in alignment of cartridges or cases in said pocket.

4,204,354

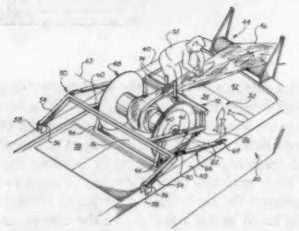
ARTICULATED FISHING DRUM

Michael J. Kane, 3602 Vining, Bellingham, Wash. 98225

Filed Mar. 5, 1979, Ser. No. 17,437

Int. Cl.[2] A01K *73/00*

U.S. Cl. 43—4.5 **28 Claims**



1. A method of reeling in a fishing net onto a fishing vessel from a deployed position in a body of water, said method being particularly adapted to permit the reeling in of said fishing net during conditions of low yield catches or high yield catches with a minimum of time and physical effort, said method comprising the steps of:

a. providing a fishing vessel having longitudinal and transverse axes and having a cockpit area defined by a floor portion, side walls and an end wall of said vessel, said end wall being provided with a rotating power roll member aligned along the transverse axis of said vessel, said cockpit area having a forward portion and a stern portion;

b. providing a drum member having a first lower operating position at a level of said side walls of said vessel, and a second upper operating position raised above said first lower operating position providing passage thereunder for crewmen on said fishing vessel, said drum member having an axis of rotation generally aligned along said transverse axis of said vessel, said drum member having hydraulic power means to effect rotation of said drum member about said axis of rotation;

c. operating said drum member in said first lower operating position during periods of low yield catches such that said net is removed from its deployed position and reeled directly onto said drum member, with the aid of said power roll member affixed to said end walls, said fish contained therein being removed as said net is reeled onto said drum member; and

d. moving said drum member to its second upper operating position during periods of high yield catches, such that said net is removed from its deployed position and placed in said stern cockpit area of said vessel with the aid of said power roll member, and the net is thereafter reeled onto said drum member in its second upper operating position and the fish are removed therefrom as said net is reeled onto said drum member,

whereby, when said drum member is moved to its second upper operative position, said stern cockpit area of said vessel is appreciably enlarged, so that during periods of large fish catches said drum member may be removed out of said cockpit area to its second upper operative position to enable said net with fish therein to be adequately contained in said stern cockpit area.

4,204,355

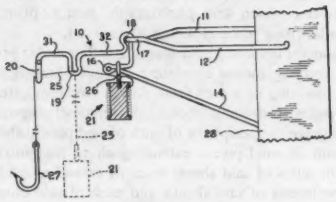
AUTOMATIC FISH CATCHER

William C. Almond, 28 Valley Dr., Little Rock, Ariz. 72209

Filed Jan. 11, 1979, Ser. No. 2,505

Int. Cl.[2] A01K *69/00*

U.S. Cl. 43—15 **8 Claims**



1. A weight-actuated fish catcher having tripodal mounting for removable outstanding attachment to an upstanding support;

said tripodal mounting means including a downwardly sloping compression leg;

said leg extending outwardly beyond said mounting means to define a fishing line guide having therealong a plurality of downwardly extending partially open eye portions;

a weight-receiving protuberance integral with said compression leg;

a weight resting on said protuberance and slidably removable therefrom;

a length of fishing line attached at one end to said weight and passing longitudinally through said eye portions; and

a fishhook at the other end of said fishing line.

4,204,356

UNDERWATER FISHING LURE RECIPROCATING DEVICE

LaVerne Smith, 7551 Thornapple River Dr., Caledonia, Mich. 49316

Filed Mar. 21, 1978, Ser. No. 888,643

Int. Cl.[2] A01K *97/00*

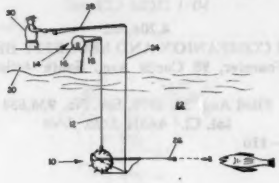
U.S. Cl. 43—26.1 **16 Claims**

1. An underwater fishing lure reciprocating device for downrigger trolling apparatus wherein a fishing line and attached lure are releasably clipped to a weighted cable and lowered from a boat by a reel a predetermined depth into the water for trolling, said reciprocating device being non-floating and being adapted to be lowered to said predetermined depth on the cable, the reciprocating device comprising:

a mounting member attached to the cable;

a reciprocating member movably mounted on the mounting

member, the reciprocating member including line engaging means for engaging the fishing line, the reciprocating member being movable with respect to the mounting member such that the line engaging means is caused to reciprocate forward and backward with respect to the mounting member generally in the direction of movement



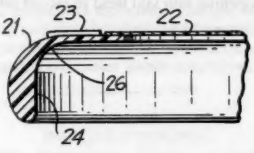
of the reciprocating device as the reciprocating device is towed through the water, said reciprocation of the line engaging means imparting said forward and backward reciprocating movement to the fishing line and lure as the reciprocating device is towed through the water; and

underwater drive means for causing the reciprocating member to reciprocate underwater.

4,204,357
FLYING DISC

Richard H. Harrington, 313 N. Seventh St., Ann Arbor, Mich. 48103

Filed Jun. 21, 1977, Ser. No. 808,593
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—74 D **42 Claims**



1. A flying disc comprising:

an annular member defining an open inner area and comprising an air-foil shaped cross-section defined by different curvature on opposite surfaces and having a thickness that depends on the radial point at which the thickness is measured; and

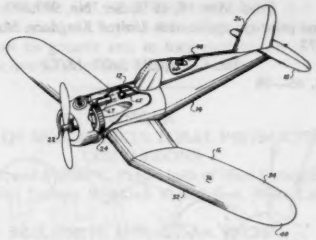
a thin sheet of a different material having a lighter weight for a volume bounded by an area of unit size and by the thickness of said sheet at said area than the average weight of a volume of said annular member bounded by an area of said unit size and by the thickness of said annular member at the thickest point thereof, said sheet having an outer perimeter affixed to said annular member to cover said open inner area.

4,204,358
ALUMINUM MODEL AIRPLANE KIT

Donald L. Briggs, 1703 Hauser Blvd., Helena, Mont. 59601

Filed Mar. 13, 1978, Ser. No. 886,123
Int. Cl.[2] A63H *27/02*
U.S. Cl. 46—76 R **6 Claims**

1. A model airplane having parts thereof such as the fuselage and wing formed of resilient, pre-stressed, sheet metal; wherein the improvement comprises: reinforcement for the wing in the

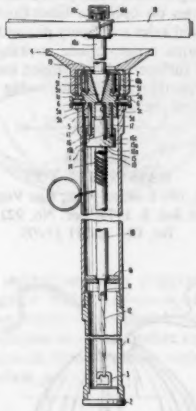


form of a channel formed from the sheet metal of the wing located inside the wing.

4,204,359
FLYING TOY

Mateo O. Plo, Bailen St., no. 12, Madrid, Spain

Filed Jul. 27, 1978, Ser. No. 928,524
Claims priority, application Spain, Aug. 9, 1977, 461,493
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—83 **4 Claims**



1. A flying toy, characterized in that it comprises a tubular body provided with a flared piece at the top, said tubular body carrying in the interior one shaft, around which appropriate means is wound for causing it to rotate from outside said tubular element, and a sleeve to the base of which is connected the upper end of said shaft in such a way that the rotary motion of the shaft can be transmitted to the sleeve, said sleeve having mounted two swinging pieces specially counterweighted and positioned in such a way that, when the sleeve rotates, said swinging pieces rock because of centrifugal force and, by means of the hooks with which they are provided, they transmit the same rotary motion to a flying element that is coupled to the top of the sleeve, the action of said hooks on the flying element being stopped and said flying element being shot off or launched when the rotary motion of the shaft and the sleeve is interrupted, after the traction means wound around the shaft has been completely unwound.

4,204,360

SEGMENTAL WALKING TOY

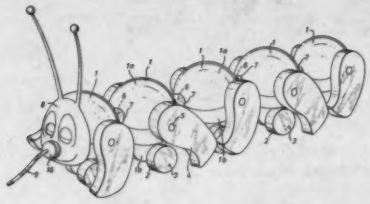
Simon W. Bentall, West Croydon, England, assignor to Hilary Page "Sensible" Toys Limited, Kenley, England

Filed May 18, 1978, Ser. No. 907,302

Claims priority, application United Kingdom, May 18, 1977, 20938/77

Int. Cl.[2] A63H *5/00, 13/02*

U.S. Cl. 46—98 7 Claims



1. A toy comprising a number of interconnected units with each unit having a pair of ground bearing wheels carried by a stub axle, the units being interconnected in a manner permitting relative movement, characterised by a unit comprising upper and lower shells which are interconnected, the lower shell carrying an axle with the ground bearing wheels at each side, the two shells when connected including a post, a rod pivoted to the post and projecting through a slot in the unit, the projecting part of the rod attached to the post of another unit and forming a connecting means, said wheels mounted on the axle in an offset manner causing the unit to perform a side-to-side rocking motion when pulled along, the upper shell including stub axles on opposite sides thereof, leg members depending from said axles and freely pivoted thereon whereby as the unit performs a side-to-side rocking motion the legs brush the ground surface and are carried back at one position of rotation of respective wheels and swing freely forward at the other position of the wheels.

4,204,361

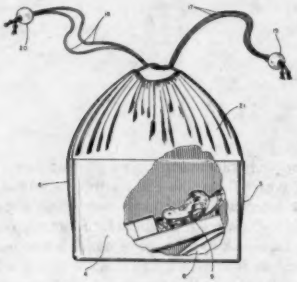
BASSINETTE TOY

Bertha E. Chaput, 190 London Ave., Las Vegas, Nev. 89109

Filed Jul. 3, 1978, Ser. No. 921,999

Int. Cl.[2] A63H *13/00*

U.S. Cl. 46—116 5 Claims



1. A bassinette toy comprises in combination a container having a bottom and side walls and an open top, a flexible decorative apron extending from the walls near the top and surrounding the container, said apron having a hemmed portion, drawstrings threaded through the hemmed portion of the apron, the apron having a normal downwardly extending position surrounding the walls of the container, and an inverted position useful for carrying the toy with the apron extending upwardly above the top of the container, the drawstrings being drawn and forming a handle for carrying, and a doll adapted to fit in reclining position within the container.

4,204,362

BABY'S COMPANION AND SECURITY BLANKET

Herve L. Fournier, 95 Curtis Ave., South Attleboro, Mass. 02703

Filed Aug. 24, 1978, Ser. No. 936,634

Int. Cl.[2] A63H *3/36, 3/46*

U.S. Cl. 46—116 5 Claims

1. A baby's security blanket and companion comprising a rectangular baby blanket, a hollow toy figure head of a soft pliable material having a neck, said neck having an opening into said head, and means for mounting said head on said blanket, said means comprising a sponge having a diameter greater than the diameter of said neck opening, whereby said sponge, surrounded by a part of said blanket, can be pushed through said opening into said head to mount said head on said blanket.

4,204,363

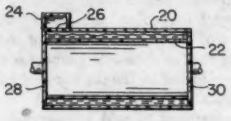
LIQUID CONTAINING AMUSEMENT DEVICE

Philip H. Knott, One San Antonio Pl., San Francisco, Calif. 94133

Filed Jun. 8, 1978, Ser. No. 913,887

Int. Cl.[2] A63H *11/10, 33/00*

U.S. Cl. 46—202 13 Claims



1. A toy tank truck comprising:

a support frame,

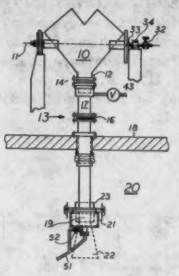
a generally cylindrical tank rotatably mounted on said support frame, said tank including an outer cylinder wall and an inner cylinder wall spaced from said outer wall to define a chamber having a limited volume of space, a liquid reservoir on said outer wall rotatably positionable above said chamber in a fill position and below said chamber in a drain position, and an opening in said outer wall for communicating a liquid between said chamber and said reservoir as said tank is rotated.

4,204,364

METHOD AND APPARATUS FOR STERILE CULTIVATION OF CELLS ON SOLID SUBSTRATES

Stephen B. Maul, Worthington; Paul A. Lemke, Cabot; Walter L. Gerner, Sarver, and John B. Yoder, Butler, all of Pa., assignors to Butler County Mushroom Farm, Inc., Worthington, Pa.

Filed Aug. 18, 1978, Ser. No. 934,683
Int. Cl.[2] A01G *1/04*
U.S. Cl. 47—1.1 **7 Claims**



1. A method for cultivation of cells on a solid substrate in a blender capable of being heated and pressurized, said method comprising:

a. bulk blending and sterilizing in said blender a mixture of moist nutrient particles for a time and at a temperature sufficient to sterilize all of said mixture to form a uniform sterile solid substrate;

b. cooling the sterilized substrate;

c. while in said blender, inoculating the bulk sterilized substrate with inoculum;

d. bulk blending the inoculum and sterilized substrate in said blender to prepare an inoculated mixture; and

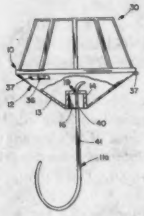
e. discharging said inoculated mixture from said blender into at least one sterile container for incubation steps c, d, and e being carried out under sterile conditions.

4,204,365

BOUQUET HOLDER

Heikki S. Hirvi, Skarholmen, Sweden, assignor to Leonard Schoenherr, Ludington, Mich.

Filed Jun. 14, 1978, Ser. No. 915,513
Int. Cl.[2] A01G *5/04*
U.S. Cl. 47—41 R **1 Claim**



1. A holder for a bouquet of flowers, said holder having a cup-shaped head for receiving a shaped block of moisture-retaining foam and a handle, said holder characterized in that said head has a boss extending into said head, said boss having walls defining an axially elongated, slit-like channel extending therethrough; said handle being an elongated member of ribbon-like cross section and of a material capable of withstanding being gripped in the hand without crushing and be readily bendable and having no memory whereby, when bent to a particular shape, it will retain that shape without spring-back; one end of said handle extending through said boss in tight frictional engagement with the walls of said channel throughout the length of said channel to provide a rigid connection between the handle and head; said one end of said handle projecting into said head beyond the end of said boss and being twisted about its greater axis to lock said handle positively against detachment from said head.

4,204,366

METHOD OF NON-AGRICULTURAL PRODUCTION OF COTYLEDONS

Jules Janick, and Valerie C. Pence, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Oct. 13, 1978, Ser. No. 951,267
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 **8 Claims**

1. A non-agricultural method for production of cotyledons comprising the steps of:

(A) Proliferation of immature cotyledonary zygotic cocoa embryos in a basal media in the presence of a growth enhancer whereby asexual embryos are initiated upon said zygotic embryos; and

(B) Growing said embryos in vitro in a basal medium; and

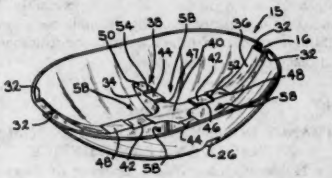
(C) Harvesting the cotyledons so produced.

4,204,367

PLANT POT HOLDER OR RESERVOIR

Richard E. Cone, Kent, Ohio, assignor to Questor Corporation, Toledo, Ohio

Filed May 10, 1978, Ser. No. 904,466
Int. Cl.[2] A01G *9/00*
U.S. Cl. 47—71 **17 Claims**



1. A plant pot support container comprising a thin-walled member of elongated hollow concave configuration, said member having an imperforate-walled longitudinally-extending recess means adapted to accommodate a support body, said member having spaced interior planar surface areas adapted for supporting a plant pot.

4,204,368

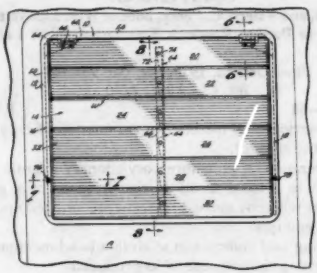
LOUVERED WINDOW SHADE DEVICE

Robert E. Lockshin, 2025 NE. 154 St., North Miami Beach, Fla. 33162

Continuation of Ser. No. 775,518, Mar. 8, 1977, Pat. No. 4,121,380, which is a continuation of Ser. No. 659,599, Feb. 20, 1976, abandoned. This application Jul. 26, 1978, Ser. No. 928,287
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.[2] E05C *7/02*
U.S. Cl. 49—67 **7 Claims**

1. A louvered window shade device for mounting relative to an automobile window having a peripheral trim strip, comprising a main body assembly including a plurality of louvers interconnected side by side to form a unitary assembly, mounting means for peripheral regions of the main body assembly and including hinge-support plate means for insertion between

the trim strip and corresponding peripheral regions of the window and latch-support plate means for insertion between the trim strip and corresponding peripheral regions of the window remote from the first-mentioned peripheral regions, hinge means for interconnecting peripheral regions of the main body assembly and the hinge-support plate means to permit the main body assembly to be pivoted on the hinge-support plate means between open and closed positions relative to the window, and latch means having cooperating engageable means on the main body assembly and on the latch-support plate means that are engaged when the main body assembly is closed



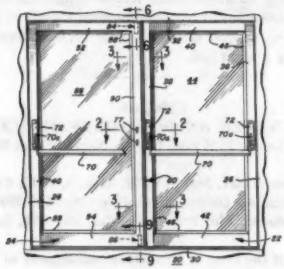
relative to the window, the latch-support plate means and the engageable means thereon being movable along the window independently of the engageable means on the main body assembly so that the latch-support plate means may be inserted between the trim strip and the window independently of the main body assembly and then the engageable means on the latch-support plate means may be engaged with the cooperating engageable means on the main body assembly, the latch means and the hinge means securing the main body assembly to the mounting means so that the louvered window shade device is held in place on the window.

4,204,369

ENTRANCE DOOR SYSTEM WITH AUTOMATIC ASTRAGAL AND PANIC DEVICE

S. Eugene Hubbard, Niles, Mich., assignor to Kawneer Company, Inc., Niles, Mich.

Filed Aug. 31, 1978, Ser. No. 938,641
Int. Cl.² E06B *7/20*
U.S. Cl. 49—319 **25 Claims**



1. In combination:

a door having an elongated edge and mounted in a door frame;

latch means on said door adapted to normally latch said door with said door frame and releasable to an unlatched condition;

an elongated astragal mounted in parallel along said door edge for movement inwardly and outwardly relative to said edge between retracted and extended positions;

manual actuator means on said door for moving said astragal between said retracted and extended position; and

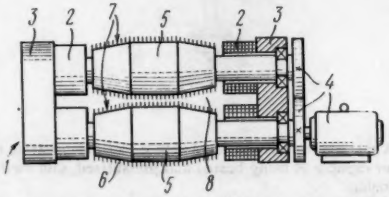
means interconnecting said astragal with said latch means for unlatching the same when said astragal is moved toward said retracted position by said actuator means.

4,204,370

APPARATUS FOR WORKING SHEET MATERIALS WITH FERROMAGNETIC POWDER

Boris N. Shikhirev, Novoalexeevskaya ulitsa, 1, kv. 146; Evgeny A. Matrosov, 2 Filevskaya ulitsa, 10/13, korpus 1, kv. 64, and Ilya A. Deresh, Krasnokholmskaya naberezhnaya, 1/15, kv. 343, all of Moscow, U.S.S.R.

Filed May 30, 1978, Ser. No. 910,738
Int. Cl.² B24B *7/12*
U.S. Cl. 51—80 A **10 Claims**



1. In an apparatus for working sheet materials with ferromagnetic powder, comprising a magnetic system adapted to retain the ferromagnetic powder, including two rolls of a magnetically permeable material, mounted with a gap left therebetween for the passage of the material to be worked and rotatable in opposite directions, and means for inducing a magnetic flux with a magnetic circuit provided at least at the side of the first ends of the rolls, so that the magnetic lines of the magnetic flux pass axially of the rolls and cross the gap therebetween, one of the two rolls acting as one of the pole pieces of the system, and the other roll acting as the other pole piece of the same system, whereby the ferromagnetic powder can be pulled in operation in the form of a layer through the gap between the rolls, the improvement which comprises tapering portions at the extremities of the magnetically permeable rolls, in an area of the relatively high density of the magnetic flux for levelling out the distribution of the grains of the ferromagnetic powder in the layer formed in the gap between the rolls throughout the length of the gap.

4,204,371

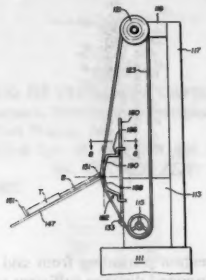
TOOL SHARPENING FIXTURE FOR A GRINDING TOOL

Norman H. Horwitz, 6608 Cottonwood Knoll, West Bloomfield, Mich. 48033

Continuation-in-part of Ser. No. 806,821, Jun. 15, 1977, Pat. No. 4,091,574. This application May 30, 1978, Ser. No. 910,934
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.² B24B *3/60, 21/10*
U.S. Cl. 51—141 **7 Claims**

1. A tool sharpening fixture for a grinding tool having at least a pair of spaced pulleys, a continuous flexible abrasive belt mounted around said pulleys with one of said pulleys being power driven, the fixture comprising a generally upright platen member retained adjacent one run of said continuous belt and a U-shaped platen releasably retained on said upright member having a laterally extending C-shaped bite portion supportably and guidably bearing against the interior surface of said belt, said U-shaped platen having a pair of opposed spaced legs, each having an elongated slot receiving said upright member, at least one of said legs including means releas-

ably retaining said platen on said upright member, an elongated support arm pivotally supported on said grinding tool, angularly and adjustably mounted on said grinding tool, and support means slidably mounted on said arm for retaining a tool having a blade in bearing contact with said belt.



4,204,372

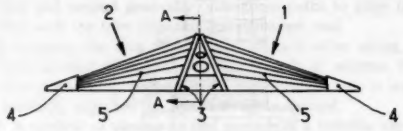
RETRACTABLE ROOF

Berdje Agopyan, 49 Avenue Carnot, Massy, France (91300)

Filed Jul. 5, 1978, Ser. No. 922,236

Int. Cl.[2] E04B *1/342*

U.S. Cl. 52—64 **6 Claims**



1. A building structure having a roof which can be retracted, the structure comprising a self-supporting frame structure having at least one circular, arc-shaped beam fixed at its respective ends with its mid-point uppermost, and at least one fixed support beam shorter than said arc-shaped beam positioned at a point in a substantially vertical plane passing through said mid-point and at substantially equal distances from said ends, each of said beams having respective means thereon to support mobile roofing members; a plurality of said mobile roofing members extending between said beams, said mobile roofing members being retractable over a respective adjacent lower said roofing member in a fan-like manner to completely open the roof; and storage means for receiving and holding said roofing members when completely retracted, said members when completely retracted being out of sight from inside the building structure.

4,204,373

COMPRESSED EXPANDABLE INSULATION TAPE AND METHOD

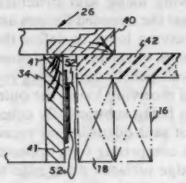
James D. Davidson, 67 Grantour Ct., Pontiac, Mich. 48055

Filed Sep. 8, 1978, Ser. No. 940,720

Int. Cl.[2] E04B *1/74;* E06B *1/04*

U.S. Cl. 52—204 **15 Claims**

1. An energy conserving structural element, comprising an outer frame adapted to be inserted into an opening therefor with sufficient clearance to leave a relatively narrow air gap around said frame, said element having a strip of compressed expandable thermal insulation attached substantially around the outer periphery of said frame, said insulation strip having enveloping means to maintain the same in a compressed condition, said enveloping compressing means being easily tearable



so as to be capable of being rendered inoperative so as to allow said strip to expand to substantially fill said air gap.

4,204,374

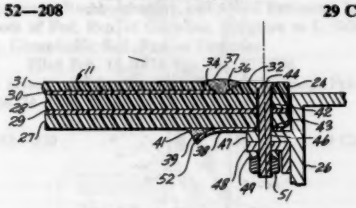
EDGE DESIGN FOR IMPACT RESISTANT WINDSHIELD

Jan B. Olson, Northridge, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Filed Nov. 10, 1977, Ser. No. 850,298

Int. Cl.[2] E04C *1/00*

U.S. Cl. 52—208 **29 Claims**



1. An impact resistant window comprising:

a plurality of transparent synthetic plastic sheets bonded together by at least one flexible interlayer, the innermost sheet being formed of polycarbonate;

a metal bearing strip adhesively bonded on the inner face of the innermost polycarbonate sheet along at least part of an edge of the window, the inboard edge of the bearing strip curling gradually away from the inner face of the innermost sheet presenting a convex side of the bearing strip towards the innermost sheet;

a flexible adhesive between the bearing strip and the innermost sheet including a generally wedge-shaped portion between the convex side of the inboard edge of the bearing strip and the adjacent face of the innermost sheet; and

means for connecting the edge of the window and bearing strip to a frame or the like.

4,204,375

FRAME CONSTRUCTION FOR A DIVIDER WALL

Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Division of Ser. No. 728,383, Sep. 30, 1976, Pat. No. 4,100,709.

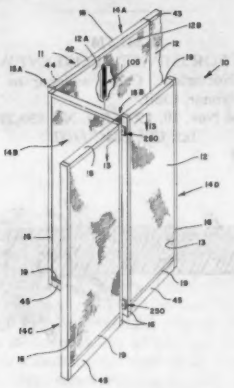
This application Dec. 23, 1977, Ser. No. 863,848

Int. Cl.[2] E04H *1/00;* E04B *1/00*

U.S. Cl. 52—239 **5 Claims**

1. At least two frames for a free-standing, vertical divider wall, each frame comprising a plurality of structural components having a generally C-shaped cross-section with a planar web having longitudinal edges, generally parallel sidewalls extending from the longitudinal edges of the web and terminating in opposed, coplanar, inwardly extending flanges, a medial cavity extending longitudinally of each said structural component and opening between said opposed flanges; at least two of said structural components in each frame being horizontally spaced and disposed as vertical support members; at least two of said structural components in each frame being horizontally

disposed and vertically spaced as top and lower members; means in each frame to conjoin said top and lower members to said vertical support members in order to delineate a quadrilateral panel receiving locus; said structural components being arranged such that the opposed flanges are disposed facing the quadrilateral receiving locus to define the outer perimeter of said receiving locus, and said webs define the outer perimeter of each frame; wall panel means being removably received in said quadrilateral receiving locus; the outer dimensions of said wall panel means being substantially equal to the corresponding dimensions of said quadrilateral receiving locus and said wall panel means comprising two, opposed planar faces, a pair of vertical side edge surfaces, a top edge surface and a bottom edge surface; said vertical side edge surfaces, top edge surface and bottom edge surface being in abutting relationship with said opposed flanges to permit said wall panel means remov-



ably to be received within said quadrilateral receiving locus; one vertical support member in a first frame being located adjacent a run of said top and lower members and between successive vertical members in the second frame; at least one lock slide; said lock slide having a base plate selectively positionable along at least one of said horizontally disposed members of said second frame and received between said horizontally disposed structural component and said wall panel to engage said opposed flanges on said horizontally disposed structural member; means extending within said medial cavity to secure said base plate to said horizontally disposed structural component at the selected location; said lock slide also having a coupling plate; means to secure said coupling plate to the web of said vertical support member in said first frame located laterally adjacent the horizontal in said second frame to which the base plate of said lock slide is secured.

4,204,376

MOLDINGS FOR ARTICLES

Scott A. Calvert, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 14, 1978, Ser. No. 924,605
Int. Cl.[2] E04F *19/02*
U.S. Cl. 52—309.1 **7 Claims**

1. A finishing strip adapted to engage a wall and an article having a flange adapted to be secured to the wall comprising:

a first rigid section having a channeled portion adapted to engage said flange such that at least part of the channeled portion is positioned between the wall and the flange;

a second rigid section having at least one projection adapted to limit the relative spacing between said first section and second section, said second section having an extended portion having a tab adapted to engage an ear projecting from said first section to fixedly position said first section with respect to said second section;

a first flexible section joined to said first rigid section and said second rigid section adapted to permit relative movement between said first and second sections; and

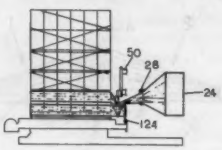
a second flexible section projecting from said second rigid section a predetermined distance sufficient to contact the wall when said finishing strip is in the closed position.

4,204,377

PROCESS AND APPARATUS FOR WRAPPING NETTING MATERIAL AROUND A LOAD

William G. Lancaster, and Patrick R. Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 709,957, Jul. 30, 1976, which is a continuation of Ser. No. 478,523, Jun. 12, 1974, abandoned. This application Jun. 1, 1978, Ser. No. 911,652
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—399 **14 Claims**



1. A process of making a spiral wrapped unitary package from a load comprising a plurality of units comprising:

a. placing a leading edge of a roll of stretchable material from a dispensing means adjacent a load;

b. holding said leading edge of said roll of stretchable material in a fixed position adjacent said load;

c. applying tension to the roll of stretchable material so that the material is stretched as it is removed from said roll and wrapped around said load as the load is rotated;

d. moving the dispensing means in a directon parallel to the center axis of the load away from one end of the load to form a plurality of overlapping wraps on the surface of the load;

e. moving the dispensing means in an opposite direction from its first direction away from the other end of the load to form a plurality of overlapping wraps on the wrapped surface of the load;

f. applying a force on the material web to reduce its width to a width less than 50% of its original web width;

g. wrapping said reduced width material web around a part of said load and a structure positioned adjacent to but spaced away from said load which separates said reduced width web from said load a predetermined distance sufficient to allow substantially unrestricted entry of a tucking mechanism;

h. continuing the wrap of said reduced width material around said load and holding a portion of said reduced width material in a fixed position in a tucking mechanism;

i. carrying said held portion of material into a space formed between the load surface and the material web wrapped around said structure; and

j. severing the material web from said dispensing means and releasing the reduced width web removed from said load

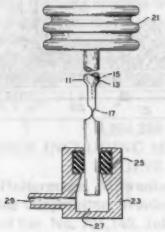
surface so that it is pulled inward by the material trying to reach its normal memory state thereby holding the severed edge in a fixed position under its wrapping surface.

4,204,378

METHOD OF CLOSING A CAPILLARY TUBE

Paige W. Thompson, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 24, 1978, Ser. No. 899,596
Int. Cl.[2] B65B *31/06*
U.S. Cl. 53—403 36 Claims



1. A method of closing a metallic capillary tube comprising the steps of:

(a) moving a pair of dies with respect to each other along first and second generally orthogonal paths to align the dies with the tube disposed therebetween; and

(b) actuating the dies with respect to each other along at least another generally orthogonal path to squeeze the tube at a selected region thereof and close the tube at least generally adjacent the selected region thereof.

10. A method of closing an end portion of a metallic capillary tube comprising the steps of:

(a) connecting the tube in an arc welding circuit as one electrode thereof with a supply of molten metal being connected in the arc welding circuit as an opposite electrode thereof;

(b) moving the tube with respect to the molten metal supply and disposing the end portion of the tube in a welding position at least adjacent the surface of the molten metal supply;

(c) creating an arc between the end portion of the tube and the molten solder supply when the end portion of the tube is in its welding position and fusing the metal of the tube adjacent the end portion to effect a sealing closure thereof.

4,204,379

CLOSED CIRCUIT SHRINK TUNNEL

Giorgio Mugnai, and Paolo E. Vietto, both of Milan, Italy, assignors to W. R. Grace & Co., Duncan, S.C.

Filed Sep. 5, 1978, Ser. No. 939,748
Int. Cl.[2] B65B *31/02, 53/06*
U.S. Cl. 53—512 9 Claims

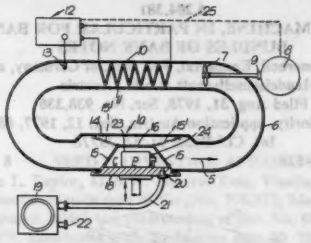
1. A shrink tunnel for use in shrink packaging articles, comprising:

means defining a work section with an inlet end and an outlet end;

means defining a return section communicating with said inlet end and said outlet end;

velocity boosting means located within said means for defining said return section for boosting the velocity of air traveling through said return section;

heating means for heating said air located within said means defining said return section; and



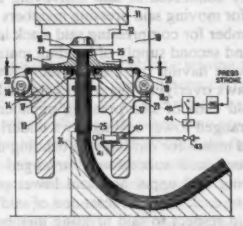
control means responsive to air temperature for controling said velocity boosting means.

4,204,380

DEVICE FOR CONVEYING, STACKING, AND PACKING ALIGNED LAMINATIONS OF ELECTRICAL MACHINES

Ewald Bergmann, Rechberghausen, and Alfred Kottmann, Donzdorf, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Feb. 15, 1978, Ser. No. 877,806
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706274
Int. Cl.[2] B32B *31/10, 31/18*
U.S. Cl. 53—520 9 Claims



1. A device for feeding, stacking, and packaging aligned laminations of electrical machines punched by a press from a strip of material fed stepwise and carried away by guide elements, said guide elements guiding the laminations initially vertically and then along a curve away from the vicinity of the press, whereby the guide elements are formed by at least one stacking shaft located downstream of a die of a cutting tool and guideways associated with said stacking shaft, comprising automatically operating connecting devices disposed along the guideways by means of which connecting devices the aligned laminations, traveling along in a continuous stream, can be connected continuously with one another, characterized by the fact that the connecting devices are made of elements of a unit, by the fact that connecting material is continuously guided over the elements of the unit from appropriately disposed dispensers to the line of punched laminations to be connected together, by the fact that the elements of the unit are made of elastic material, are mounted along the path of the guide elements, extend into the path of the laminations carried by the guide elements, and are mounted for displacement outwardly with respect to said path under the influence of laminations fed along said path for adapting the elements of the unit to outside contours of the laminations to be connected, characterized by the fact that the connecting material consists of non-adhesive strips, and said connecting devices conform to the peripheral shape of the laminations and are operable to

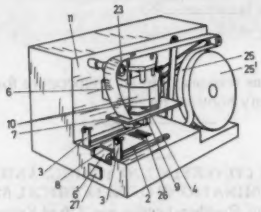
insert said strips in a self-holding manner into grooves in said laminations.

4,204,381

BANDING MACHINE, IN PARTICULAR FOR BANDING BUNDLES OF BANK NOTES

Karl E. Timmerbeil, Ennepetal, Fed. Rep. of Germany, assignor to Weka-Handelsgesellschaft m.b.H., Austria

Filed Aug. 31, 1978, Ser. No. 938,338
Claims priority, application Austria, Sep. 12, 1977, 6517/77
Int. Cl.[2] B65B *11/52, 13/18*
U.S. Cl. 53—528 **8 Claims**



1. An apparatus for banding a stack of bank notes comprising a stationary carrier member having a feeding station and a banding station, means for conveying said stack lying parallel to said carrier member along a conveying path from said feeding station to said banding station, a pressing member overlying said path having ends in the direction of said conveying path operatively connected to said conveying means and including means for moving said pressing members downward to said carrier member for compressing said stack in said banding station, a first and second supply of banding material, a sealing and cutting device having one pair of successively arranged upper sealing jaws overlying the conveying path and located intermediate said ends of said pressing member, one pair of successively arranged lower sealing jaws underlying the conveying path and means for cutting said banding material being arranged between said successively arranged sealing jaws means for moving said upper and said lower pair of sealing jaws in respect to each other, at least one of said pairs of jaws being movable in respect to said pressing member, said pressing member having means for guiding said first supply of banding material through said members intermediate said ends above the conveying path of said stack to said sealing and cutting device, said second supply of banding material being fed to said sealing and cutting device below said conveying path of said stack, said conveying means having stops arranged on both sides of said carrier member for engaging the trailing edge of said stack, said stop means being movable from said feeding station to a position adjacent said sealing and cutting device.

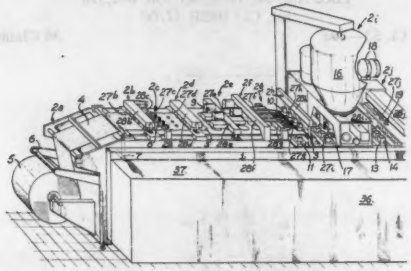
4,204,382

APPARATUS FOR PACKAGING PASTY MATERIAL

Marcel A. R. Guyonnet, 25, rue Anatole France, Chaville (Hauts-de-Sein), France

Continuation of Ser. No. 376,680, Jul. 5, 1973, abandoned, which is a continuation of Ser. No. 94318, Dec. 2, 1970, abandoned.
This application Oct. 4, 1978, Ser. No. 948,573
Claims priority, application France, Dec. 4, 1969, 69 41904
Int. Cl.[2] B65B *43/08, 47/00*
U.S. Cl. 53—563 **12 Claims**

1. A machine for packaging pasty materials such as cheese in individual packages comprising an elongated continuous conveyor system, means for feeding a substantially endless thin flexible film to an end of said conveyor system, a plurality of work stations spaced successively along said conveyor system, each of said work stations having a plurality of identical tools for performing a single operation on said film, the tools of each station being longitudinally aligned with those of the other stations to provide a plurality of parallel processing lines, said work stations being divided into at least two groups arranged along said conveyor system, the first group functioning to successively cut the leading end of said film and shape said film into individual flexible shells arranged in successive ranks with respect to said conveyor system and a second group functioning to simultaneously fill said flexible shells in each successive rank and to close said filled flexible shells to form the packages, said conveyor system including conveyor means associated



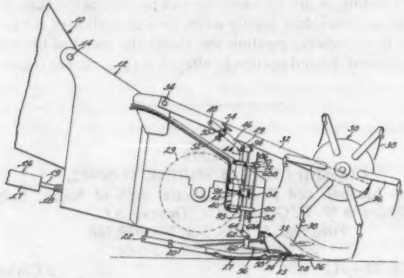
with said second group for carrying said flexible shells between the successive work stations comprising a plurality of spaced transverse transfer bars, each having receiving supports for each shell in each rank, said supports being aligned in rank and means for synchronously indexing said conveyor through said successive work stations and operating each of said tools simultaneously at each of said work stations on completion of each index, said conveyor system including a common driving means connected to the ends of said bars and actuating means which reciprocably indexes said transfer bars with respect to each of the work stations along said conveyor means.

4,204,383

AUTOMATIC HEIGHT CONTROL FOR GATHERING REEL FOR AGRICULTURAL COMBINE

James W. Milliken, Jr., Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 29, 1978, Ser. No. 920,193
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—10.2 **15 Claims**



1. In an agricultural combine of the type having a header positioned at the forward end of the combine which is adapted to receive a cut crop for threshing, a floating cutter assembly pivotally mounted at the forward end of said header and adapted to floatingly move vertically relative to said header in accordance with variations in the contour of the terrain passed over by said cutter assembly and in order to pass over obstacles in the path of said cutter assembly, and a gathering reel carried

by said header and positioned forwardly of said cutter assembly relative to the forward direction of movement of said combine and having an optimum vertical position relative to said cutter assembly, the improvement which comprises means for vertically moving said gathering reel relative to said header in closely tracking relation with the vertical movement of said cutter assembly whereby to avoid interference between said cutter assembly and said gathering reel during vertical movement of said cutter assembly, comprising sensing means for sensing the vertical position of said cutter assembly relative to said header, motor means operatively connected to said gathering reel for changing the vertical position of said gathering reel relative to said header, and control means responsive to said sensing means for controlling said motor means to change the vertical position of said gathering reel relative to said header in closely tracking relation with changes in the vertical position of said cutter assembly, said control means including mechanical follow-up means for stopping operation of said motor means when said gathering reel has been restored to said optimum vertical position relative to said cutter assembly.

4,204,384

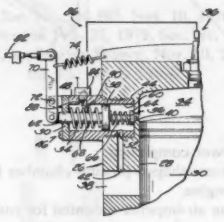
LAWN MOWER INCLUDING MEANS FOR STOPPING ENGINE

Theodore J. Holtermann, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 705,140, Jul. 14, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,615

Int. Cl.[2] A01D *75/20*

U.S. Cl. 56—10.5 **13 Claims**



1. A lawn mower comprising a frame, a rotatable cutter blade supported on said frame, an internal combustion engine supported on said frame and including an engine block having a cylinder and a piston mounted inside said cylinder for reciprocative compression and expansion strokes and cooperating with said cylinder to form a combustion chamber, means for stopping said engine including an outlet port in said engine block opening into said combustion chamber, a discharge port communicable with said outlet port, valve means including an internal flow passage interposed said outlet and discharge ports and a valve control element operable in said flow passage between a first position for permitting communication between said outlet and discharge ports and a second position for blocking communication between said outlet and discharge ports, said valve means also including a valve assembly, operable in response to the pressure in said combustion chamber when said valve control element is in the first position, to selectively permit and block communication between said outlet and discharge ports whereby said valve assembly is moved to an open position to permit gases to vent from said combustion chamber through said discharge port during the compression stroke of said piston and said valve assembly is moved to a closed position to prevent gases from entering said combustion through said discharge port during the expansion stroke of said piston, means for biasing said valve control element toward the first position, and control means operatively connected to said biasing means and said valve control element and movable between an operating position where the biasing force of said biasing means is overcome and said valve control element is moved to the second position and a non-operating position where said biasing means moves said valve control element to the first position.

4,204,385

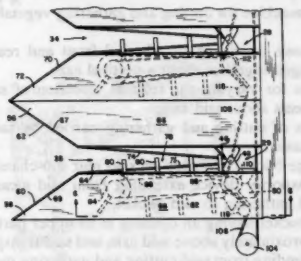
SEED HARVESTING APPARATUS

Clyde L. Taylor, 4146 W. Mineral King, Visalia, Calif. 93277

Continuation-in-part of Ser. No. 776,872, Mar. 11, 1977, abandoned, which is a continuation of Ser. No. 596,718, Jul. 17, 1975, abandoned. This application Jun. 30, 1978, Ser. No. 920,779

Int. Cl.[2] A01D *45/30*

U.S. Cl. 56—14.3 **12 Claims**



1. In an apparatus for harvesting sesame stalks standing in rows in a field and having pods thereon carrying sesame seeds therein, said pods being of a type which have a tendency to shatter and release their seeds when they are moved or jarred, a vehicle adapted to be moved through the field, stalk severing apparatus carried by the vehicle, said stalk severing apparatus including first and second stalk guiding assemblies defining a generally V-shaped opening for receiving and guiding stalks as the vehicle is advanced in the field, an upwardly facing seed receiving pan which is open throughout its entire length carried by each of said stalk guiding assemblies for receiving and collecting seeds which accidentally fall from the pods during the time the stalks are moving in the generally V-shaped opening between the guiding assemblies, said pan for each stalk guiding assembly extending up to the forwardmost extremity of the stalk guiding assembly, rotary-type cutoff means operating at a high rate of speed disposed in the vicinity of the rear of said generally V-shaped opening for severing said stalks as they travel in the generally V-shaped opening with a minimum of vibration to thereby minimize the scattering of seeds from the pods as the stalks are severed, conveyor-type means carried by the vehicle for collecting severed stalks and the seeds collected in said seed receiving pans and seed separating means carried by the vehicle for receiving the stalks and seeds from the conveyor-type means, at least one of stalk guiding assemblies including a plurality of fingers extending into said generally V-shaped opening and in the vicinity of the rotary cutoff means extending substantially traversely across said V-shaped opening and means for moving said fingers in said opening at a speed which is approximately equal to the speed of movement of the vehicle in the field for maintaining the stalks in generally upright positions without jolting of the stalks as they are advanced through the V-shaped opening, said fingers being adapted to engage said stalks in the V-shaped opening prior to, during and after the time they are cut off by the rotary cut off means.

4,204,386

MACHINE FOR CUTTING AND GATHERING VEGETABLES

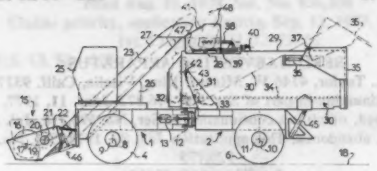
Mario Spinoglio, Peronne, France, assignor to Societe Anonyme dite: Ets Bonduelle a Renescure, France

Filed Aug. 3, 1978, Ser. No. 930,712

Claims priority, application France, Apr. 24, 1978, 78 13263

Int. Cl.[2] A01D *90/00*

U.S. Cl. 56—14.4 **17 Claims**



1. A machine for cutting and gathering vegetables, comprising:

a chassis consisting of wheeled front and rear sub-chassis hinged together about a vertical axis;

means for varying the relative direction of said two sub-chassis about said axis;

means of cutting and gathering carried by said front sub-chassis;

storage bucket arranged on said rear sub-chassis; and

a transporter device extending from said means of cutting and gathering to said bucket;

said bucket having an opening in its upper part and located approximately above said axis, and said transporter device ascending from said cutting and gathering means towards said bucket, the upper end of said transporter device being situated approximately above said axis and said opening.

4,204,387

GEAR DRIVE FOR MULTIPLE ROW HARVESTER

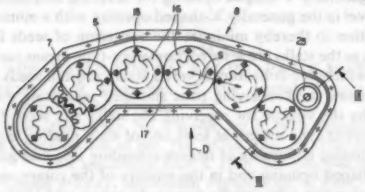
Theodor Eistert, Neustadt; Gerhard Schmidt, Kirschau; Christian Noack, Guttau; Manfred Teichmann, Bischofswerda; Bernd Zumpe, Rathmannsdorf; Manfred Eidam, Wilthen; Hans-Peter Spaida, Neustadt; Stefan Rauschenbach, Grosspostwitz; Karlheinz Paulisch, Kirschau, and Siegfried Scholz, Wilthen, all of German Democratic Rep., assignors to Veb Kombinat Fortschritt Landmaschinen Neustadt In Sachsen, Neustadt in Sachsen, German Democratic Rep.

Filed Jun. 6, 1978, Ser. No. 913,234

Claims priority, application German Democratic Rep., Jun. 6, 1977, 1199317

Int. Cl.[2] A01D *45/00*

U.S. Cl. 56—98 **15 Claims**



1. A row-crop harvester comprising:

a frame adapted to travel along the ground in a predetermined travel direction and forming a plurality of forwardly opening throats;

a nonstraight row of drive sprockets each at one end of a respective one of said throats, said row including at least one inner sprocket flanked by at least two outer sprockets with said inner sprocket spaced in said direction from said outer sprockets;

respective conveyor chains spanned over said drive sprockets and having respective stretches in the respective throats;

respective drive shafts on said drive sprockets;

respective drive gears on said drive shafts and together forming a nonstraight drive train with each drive gear meshing with at least one other gear, all of said gears lying generally in a common drive plane; and

means for rotating one of said drive shafts and thereby rotating all of said drive gears with each drive gear rotating in a direction opposite that of any of said drive gears in mesh with itself.

4,204,388

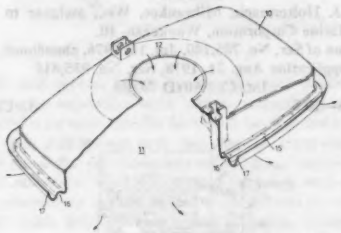
AIR CUSHION MOWERS

Frank Dawson, Littleover, England, assignor to Qualcast (Lawn Mowers) Limited, Sunnyhill, England

Filed Jul. 31, 1978, Ser. No. 929,663

Int. Cl.[2] A01D *35/20, 53/00*

U.S. Cl. 56—320.1 **6 Claims**



1. A lawnmower comprising:

a generally dome-shaped plenum chamber for supporting a motor or engine,

a cutter and an air-impeller mounted for rotation within the said chamber,

an air intake positioned centrally in the roof of said chamber above said impeller such that, in use, the impeller produces a cushion of air in the chamber bounded by a vortiginous air curtain,

a peripheral flange extending outwardly from the bottom edge of said chamber in a direction substantially parallel to the ground,

and means associated with said flange for partially trapping the turbulent air escaping from the said chamber beneath said flange whereby the rate of air loss from the said cushion is substantially reduced.

4,204,389

MACHINE FOR HARVESTING IN-LINE CROPS

Gilbert Delfosse, Avrille, France, assignor to Braud, Société Anonyme, Angers, France

Filed Aug. 2, 1978, Ser. No. 930,402

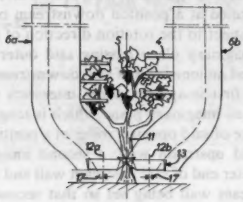
Claims priority, application France, Aug. 12, 1977, 77 24847

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—330 **5 Claims**

1. A machine for harvesting in-line crops, comprising a frame movable in relation to the ground along rows of plants, means for separating the crop from the plants, and at least two conveyors for transferring the crop inside the machine which form a pair of closed loops disposed side by side, each conveyor comprising a substantially horizontal bottom run, a substantially upright rear run and a substantially upright front run, and a top run, said bottom runs of the two conveyors being disposed adjacent to each other and guided on either side of a row of plants in order to clamp said plants of said row at

the lower portion of the stems thereof, to gather the detached crop so that the latter falls directly upon said bottom runs, and to transfer said crop to the rear of the machine, the upright runs of each conveyor departing laterally and outwardly of the machine in relation to the vertical plane passing through the



longitudinal axis of the corresponding bottom run only in the lower portions of said upright runs and being substantially vertical in their upper portions to form non-planar loops, the linear velocity of said bottom runs in relation to said frame being opposed and substantially equal to the linear velocity of travel of the machine along said row of plants.

4,204,390

HARVESTING MACHINE

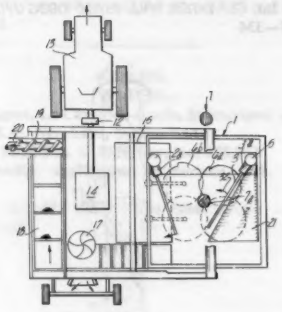
Alain Bruel, Domain du Petit Chaumont, Aigues Mortes (Gard), France

Continuation of Ser. No. 740,503, Nov. 10, 1976, abandoned. This application Feb. 21, 1979, Ser. No. 13,441

Claims priority, application France, Nov. 10, 1975, 75 35103

Int. Cl.[2] A01G *19/00*

U.S. Cl. 56—330 **14 Claims**



1. A mobile crop harvesting machine having drive means and comprising:

a driven mobile chassis;

a frame structure mounted on said chassis, said frame structure having one end portion defining a tunnel member in the shape of a downwardly open "U" and an opposite end portion defining a housing;

at least one oscillating arm member connected to said drive means and mounted to said tunnel member, said at least one oscillating arm member further comprising:

at least two substantially vertical thresher members mounted to said oscillating arm member;

a plurality of beaters mounted to said substantially vertical thresher members for movement therewith;

a first means for recovering a crop, said recovery means having one end attached to said tunnel member and an opposite end attached to one of said beater members;

a second means for recovering said crop mounted on the lower end of said housing and in spaced relationship to said first recovery means, said second recovery means communicating with said first recovery means, said second recovery means further comprising:

a means for processing said crop mounted on and within said housing, said processing means communicating with said second recovery means, said processing means further having means for selectively separating the harvested crop according to the aging of said crop.

4,204,391

OPEN END SPINNING MACHINE FRAME CONSTRUCTION

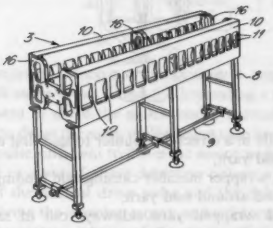
James W. B. Clayton, Accrington, and Douglas O. Clough, Rossendale, both of England, assignors to Platt Saco Lowell Limited, Helmshore, England

Filed May 31, 1978, Ser. No. 911,657

Claims priority, application United Kingdom, Jun. 2, 1977, 23332/77

Int. Cl.[2] D01H *1/16, 1/12*

U.S. Cl. 57—1 R **7 Claims**



1. In a frame construction for an open-end spinning machine for supporting a plurality of spinning units and their drive and servicing components along each of the two longitudinal sides of said machine, the improvement comprising

first and second spinning unit supporting members, each comprising a vertically disposed substantially planar elongate plate formed with a plurality of apertures spaced therealong for receiving and supporting therein a like plurality of spinning units, wherein each plate has an inwardly projecting flange at the upper extremity thereof, said plate being defined between said flange extremity and a lower extremity parallel thereto, and

a plurality of cross members, each extending transversely between and rigidly interconnected to said supporting members in such manner as to be wholely contained between said upper and lower extremities, and being formed with and defining a recess therethrough suitable for receiving and supporting a suction duct extending parallel to said supporting members.

4,204,392

METHOD AND DEVICE FOR THE PRODUCTION OF A WRAPPED YARN

Erich Bock, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,338

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804542

Int. Cl.[2] D02G *3/36*; D01H *7/86*

U.S. Cl. 57—18 **6 Claims**

1. A method of producing a wrapped yarn of the type having a bundle of textile fibers essentially without twist wrapped spirally by a binding-thread, wherein the delivered bundle of textile fibers is false-twisted before the wrapping and is introduced together with the binding-thread into the hollow spindle of a wrapper member having a binding-thread bobbin, and the

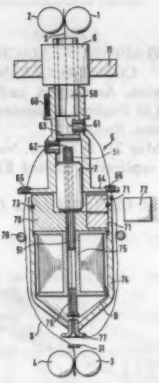
wrapped yarn is subsequently drawn out of the wrapper member, said method comprising:

introducing the yarn in the false-twisted state into the hollow spindle of said wrapper member;

leading said yarn sideways out of said hollow spindle and in a first direction past the binding-thread bobbin;

deflecting said yarn into said hollow spindle again;

passing said yarn and said binding-thread through the hollow spindle in a direction counter to said first direction of pass of said yarn;



providing a wrapper member causing said binding-thread to be wrapped around said yarn;

leading said wrapped yarn sideways out of said hollow spindle and drawing said wrapped yarn from said hollow spindle in said first direction so that the binding-thread at each revolution of the wrapper member is wrapped twice around said yarn.

4,204,393

DUST REMOVING MECHANISM IN OPEN-END SPINNING FRAME

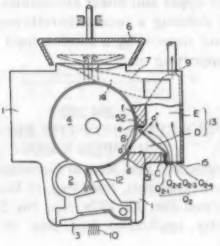
Tsutomu Miyazaki; Masao Shiraki, both of Kariya, and Kinpei Mitsuya, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakucho, Aichi, Japan

Filed Dec. 20, 1978, Ser. No. 971,499

Claims priority, application Japan, Dec. 27, 1977, 52-159734; Mar. 9, 1978, 53-027080

Int. Cl.[2] D01H *11/00*

U.S. Cl. 57—301 **13 Claims**



1. In an open-end spinning unit provided with an opening roller and a casing partly surrounding said opening roller, a dust removing opening formed on said casing and a dust removing zone communicated with said dust removing opening, a dust removing mechanism applied for said spinning unit, comprising a pair of upstream and downstream walls located at the respective positions extended from the upstream and downstream terminals of said dust removing opening, respectively, in connection with the rotational direction of said opening roller, so that a dust-separation zone is formed in said dust-removing zone by said upstream and downstream walls, a dust-discharging zone communicated with said dust-separation zone, an outer air intake opening formed at an external position of an outer end of said upstream wall, a dust-discharging suction opening formed at a position downstream of said intake opening with respect to the rotation direction of said opening roller, a first imaginary plane passing said outer end of said upstream wall and an inner end of said downstream wall being set so that said first imaginary plane intersects substantially perpendicularly an imaginary plane which is tangential to the peripheral surface of said opening roller at a position facing an inner end of said upstream wall, a second imaginary plane including said outer end of said upstream wall and an outer end of said downstream wall being set so that second imaginary plane gradually becomes separated from said dust-discharging zone.

4,204,394

DEVICE RELATING TO APPARATUS FOR TEXTURING TEXTILE YARNS

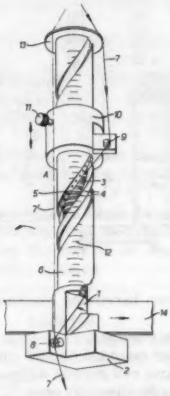
Walter Lüthi, Ebnat-Kappel, Switzerland, assignor to Heberelein Maschinenfabrik AG, Wattwil, Switzerland

Filed Jan. 11, 1979, Ser. No. 3,772

Claims priority, application Switzerland, Jan. 12, 1978, 306/78; Jan. 25, 1978, 782/78

Int. Cl.[2] D01H *7/92, 13/04;* **D02G** *1/04*

U.S. Cl. 57—334 **7 Claims**

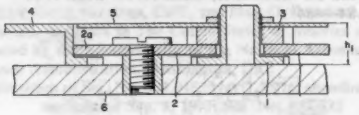


1. Apparatus for friction texturing textile yarns of thermoplastic material using the false-twist principle, comprising a base, a cylinder rotatable about its longitudinal axis on said base, spaced friction surfaces on the outer surface of said cylinder and at right angles to the axis of said cylinder, grooves between said surfaces, an outer cover surrounding said cylinder, a plurality of yarn guides projecting inwardly into said cylinder and engaging said grooves, the points of engagement of the yarn guides with said grooves being on a helical path around said cylinder, a yarn guide on said base, and a plate on the upper end of said cylider, said plate having a projecting edge for guiding the yarn.

4,204,395
CALENDAR MECHANISM OF A PORTABLE TIMEPIECE

Masataka Ikenishi; Joichi Miyazaki; Shozo Kushida, and Hiromasa Nakanishi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed May 16, 1978, Ser. No. 906,561
Claims priority, application Japan, May 20, 1977, 52/58382
Int. Cl.[2] G04B *19/24, 33/00*
U.S. Cl. 368—35 8 Claims

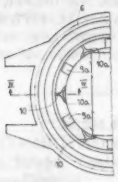


1. A calendar mechanism for a portable timepiece, comprising: a cannon wheel having a gear wheel portion and a cylindrical portion extending from said gear wheel portion axially thereof; a day star wheel mounted for rotation on the cylindrical portion of said cannon wheel and positioned coaxial with and adjacent the gear wheel portion of said cannon wheel, and said day star wheel having an outer diameter less than an outer diameter of said gear wheel portion of said cannon wheel, wherein an outer peripheral portion of the gear wheel portion of said cannon wheel extends beyond said day star wheel; and a positioning plate comprised of a plate-like member positioned to partially overlie the outer peripheral portion of the gear wheel portion of said cannon wheel and adjacent said outer peripheral portion for preventing said cannon wheel from traveling axially toward said day star wheel, and the portion of said positioning plate overlying said outer peripheral portion of said cannon wheel having a periphery which clears said day star wheel with no part of said positioning plate interposed between said day star wheel and the gear wheel portion of said cannon wheel.

4,204,396
WATCH

Jean-Luc Breguet, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Feb. 6, 1978, Ser. No. 875,562
Claims priority, application Switzerland, Feb. 16, 1977, 1888/77
Int. Cl.[2] G04B *37/04;* G04C *3/00*
U.S. Cl. 368—287 12 Claims

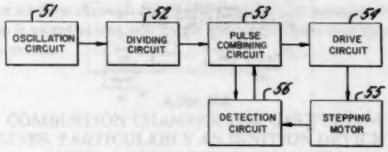


1. A watch comprising:
a molded watch casing,
a watch movement having a molded baseplate,
shock absorbing means including elastically deformable means for permanently mounting said baseplate in said watch casing, said deformable means including a first portion molded into said casing, a second portion molded into said baseplate and a shock absorbing connecting portion extending between said first and second portions free of said casing and baseplate, said elastically deformable means are a plurality of arms laterally spaced around said baseplate between said baseplate and casing, with each arm including said first portion, said second portion and said connecting portion, and
said arms are metallic tongues each having a bifurcated portion on one end thereof with at least a part of one bifurcation molded in one of said baseplate and said casing.

4,204,397
ELECTRONIC TIMEPIECE

Kazuhiro Asano; Makoto Ueda; Akira Torisawa; Masaharu Shida; Katsuhiko Satoh, and Masaaki Mandai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 20, 1978, Ser. No. 898,399
Claims priority, application Japan, Apr. 23, 1977, 52-47089
Int. Cl.[2] G04C *3/00*
U.S. Cl. 368—202 4 Claims



1. An electronic timepiece comprising: a stepping motor having a coil and a rotor; means for generating a normal drive pulse sufficient to drive the motor under normal loading but insufficient to drive the same under worst case loading, a drive correction pulse sufficient to drive the motor under worst case loading and two out-of-phase detection pulses; a drive circuit receptive of the normal drive pulse and the drive correction pulse for driving the stepping motor; and a detection circuit for detecting the rotary position of the motor rotor comprising a detection element, and a voltage comparison circuit for comparing the voltage drop across said detection element during the first detection pulse when current flows in one direction of the motor coil with the voltage drop across said detection element during the second detection pulse when current flows in the opposite direction of the motor coil whereby if the rotor is rotating, the current will flow in the opposite direction in the coil and the voltage drop is lower than that during the first detection pulse and if the rotor is not rotating, the voltage drop is greater.

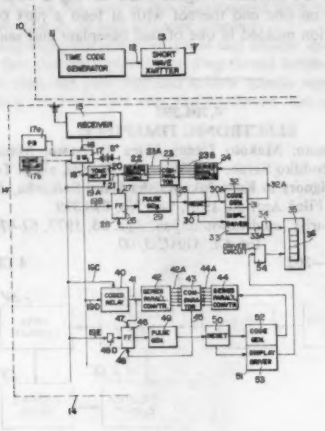
4,204,398
METHOD AND MEANS FOR AUTOMATICALLY SETTING TIMEPIECES IN A TIME ZONE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Sep. 16, 1977, Ser. No. 833,714
Int. Cl.[2] G04C *9/02, 11/02*
U.S. Cl. 36 58—47 25 Claims

1. A time keeping system comprising in combination:
a master signal generator operable for intermittently generating signals representative of time in a given time zone,
means for effecting the wireless transmission of said time signals throughout a given spatial region;
at least one electronic timepiece containing electronic circuit means for generating signals at a first rate representative of time and display means for displaying the time represented by the signal generated,
signal receiving means for receiving the signals generated by said master signal generating means,
said electronic circuit means including further circuit means connected to receive the signals from said signal receiving means and operable to alter the signal output rate of the electronic circuit means of said timepiece in accordance with variations between the values of the signals generated by the timepiece and those received from said master

signal generating means whereby the signals fed to said display means for displaying the time will be representative of the time as defined by the signals generated by said master signal generating means.



4,204,399

WRISTWATCH

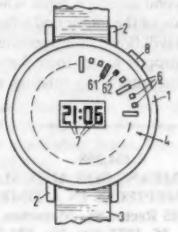
Hinrich Heynisch, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,496

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735021

Int. Cl.[2] G04B *19/06, 19/30*

U.S. Cl. 368—240 **7 Claims**



1. A method of displaying time of day on a display face of an electronic watch, comprising the steps of:

(a) providing an hour analog display formed of a first group of 12 luminescent elements arranged as a wreath corresponding to each full hour and a second group of luminescent elements of dimensions differing from the first group, elements of the second group being symmetrically arranged around the wreath and between adjacent full hour elements so as to represent fractions of full hours;

(b) providing a minute digital display formed of luminescent elements within the hour analog display wreath;

(c) displaying hours and fractions of hours in analog manner and not in digital manner on the face of the watch by chronologically activating only one of the first group luminescent elements corresponding to a full hour and also simultaneously activating in sequence all luminescent elements of the second group consecutively following the illuminated full hour element; and

(d) displaying minutes in digital manner and not in analog manner on the face of the watch by activating the minute digital display.

4,204,400

ELECTRONIC METRONOME

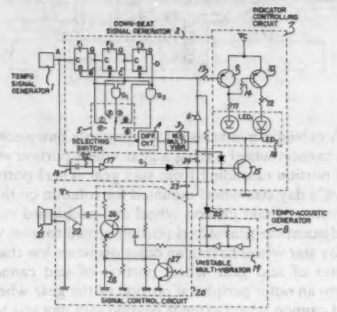
Fumio Morohoshi, and Yoshio Hasegawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 28, 1977, Ser. No. 846,396

Claims priority, application Japan, Oct. 28, 1976, 51-129673

Int. Cl.[2] G04F *5/02;* **G10B** *15/00;* **G08B** *3/00*

U.S. Cl. 84—484 **9 Claims**



1. An electronic metronome including: a tempo signal generator for generating a predetermined frequency tempo signal; means including a monostable multivibrator for developing an up beat signal and a down-beat pulse signal having a predetermined pulse length greater than the pulse length of the up beat signal from the tempo signal; and sound generating means responsive to a tempo-acoustic signal for generating sounds in response thereto, said sound generating means comprising a tempo-acoustic control circuit responsive to the down-beat signal and up beat signal for controlling the generated sounds according to the down-beat and up beat signals to distinguish the down-beat from the up beat by duration.

4,204,401

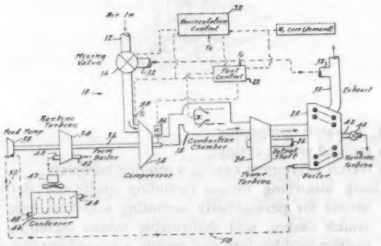
TURBINE ENGINE WITH EXHAUST GAS RECIRCULATION

Ernest R. Earnest, Hobe Sound, Fla., assignor to The Hydragon Corporation, Lake Park, Fla.

Continuation-in-part of Ser. No. 706,811, Jul. 19, 1976, abandoned. This application Jul. 21, 1977, Ser. No. 817,848

Int. Cl.[2] F02C *1/06*

U.S. Cl. 60—39.03 **18 Claims**



1. An integrated Brayton cycle-Rankine cycle engine comprising a Rankine turbine and a rotary compressor driven thereby, a Brayton turbine and an intercycle heat exchanger heated by the exhaust of the Brayton turbine and delivering heat to the Rankine fluid for powering the Rankine turbine, a

burner and air supply assembly for delivering to the Brayton turbine air from the compressor together with products of combustion from the burner, means for throttling the amount of air entering the compressor, and means for recirculating a portion of the exhaust gases from the Brayton turbine into the compressor.

4,204,402

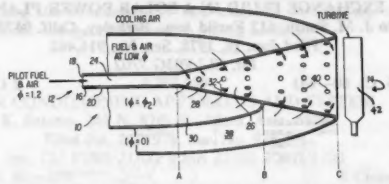
REDUCTION OF NITRIC OXIDE EMISSIONS FROM A COMBUSTOR

Roger A. Craig, Saratoga, Calif., and Huw O. Pritchard, Bolton, Canada, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 684,045, May 7, 1976, abandoned. This application Sep. 8, 1977, Ser. No. 831,632

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.06 **4 Claims**



1. A method for reducing oxides of nitrogen emissions in a turbojet combustor, comprising:

(a) dividing fuel to be burned into a large and a small portion;

(b) burning said small portion of fuel in a pilot combustion zone in a turbojet combustor with a sufficient quantity of air to provide stable combustion;

(c) introducing the combustion products from said pilot combustion zone to a main combustion zone is said turbojet combustor;

(d) adding adiabatically said large portion of fuel pre-mixed with a sufficient quantity of air to provide of fuel-lean combustion mixture, said addition being done at an overall rate which is progressively larger in the downstream direction of the combustor; and

(e) burning said fuel-lean mixture in said main combustion zone at an adiabatic flame temperature at or below 2200° K, using said pilot zone combustion products as (a) an ignition source for the fuel-lean mixture in contract with said products, with the combustion products of said first quantity of fuel-lean mixture serving in turn to ignite the next larger quantity of fuel-lean mixture, downstream and so on until the last added fuel-lean mixture has been consumed.

4,204,403

COMBUSTION SYSTEMS

David M. Howe, Bristol, England, assignor to Rolls-Royce Limited, London, England

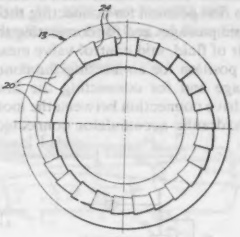
Filed May 15, 1978, Ser. No. 906,216

Claims priority, application United Kingdom, May 21, 1977, 21505/77

Int. Cl.² F02C 7/22

U.S. Cl. 60—743 **3 Claims**

1. A combustion system comprising a combustion chamber having an array of air inlet apertures distributed symmetrically about an axis, an annular array of baffles any two of which form between them a passage, each of said passages registering with an aperture, the baffles overlapping one another in the circumferential direction about said axis so that any one baffle has at one side a surface lying at the inside of a said passage and has at the other side a surface open to the interior of said chamber whereby, in operation, fluid emerging from said passages sweeps over said open surfaces, means to supply air to said apertures and thus to said passages, means for adding fuel



to the air flow through every other one of said passages so that baffle is swept at one side by air and at the other side by air/fuel mixture.

4,204,404

COMBUSTION CHAMBER FOR GAS TURBINE ENGINES, PARTICULARLY AN IGNITION DEVICE FOR SUCH A COMBUSTION CHAMBER

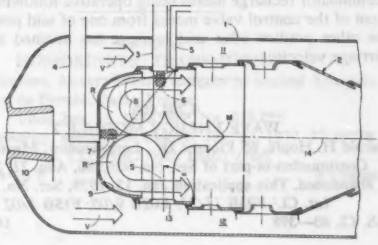
Adolf Fehler, Pfaffing; Günter Kirschey, Munich; Günter Kappler, Freising, and Gerhard Kirchdorffer, Weissach-Flacht, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union München GmbH, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,766

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722449

Int. Cl.² F02G 3/00

U.S. Cl. 60—740 **5 Claims**



1. In a combustion chamber for gas turbine engines, particularly for aircraft turbojet engines, comprising an outer casing; at least one flame tube inserted in said casing; and at least one ignition means for the produced, respectively, introduced fuel-air mixture; the improvement comprising: said ignition means including first and second high-capacity ignition plugs arranged in series in an essentially axial plane within said flame tube, said high-capacity ignitor plugs and their ignition spark zones being arranged at right angles to each other within the portion of the flame tube containing the combustion zone, and an ignition fuel nozzle forming a fuel injection spray cone which will simultaneously encompass the ingition spark zones of both said high-capacity ignition plugs.

4,204,405

REGENERATIVE DRIVE SYSTEM

Dean V. Basham, Selmer, Tenn., assignor to Tyrone Hydraulics, Inc., Corinth, Miss.

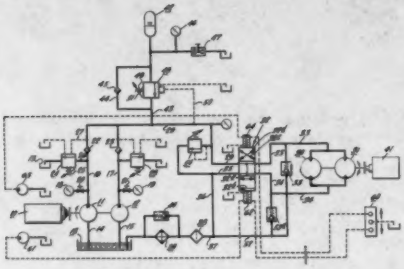
Filed May 9, 1978, Ser. No. 904,260

Int. Cl.² F15B 1/02

U.S. Cl. 60—371 **9 Claims**

1. A hydraulic drive system for a reciprocating carriage

comprising fixed displacement pump means, reversible hydraulic motor means having first and second fluid passages, a fluid supply conduit means for delivery of fluid under pressure from the pump means to the motor mean, control valve means movable to a first position for connecting the conduit means to the first of said passages and for connecting the second passage to a reservoir of fluid, said control valve means being movable to a second position for connecting the conduit means to the second passage and for connecting the first passage to the reservoir, a drive connection between the motor means and the carriage, a hydraulic accumulator connected to said conduit



means, accumulator valve means for discharge of fluid under pressure from the accumulator to the conduit means in response to load pressures in said conduit means in excess of a predetermined value, and means for recharge of said accumulator, means including said drive connection, whereby the inertial forces on the carriage drive said motor means as a pump to deliver operating fluid under pressure to said accumulator for use during other portions of an operating cycle. said accumulator recharge means being operative following movement of the control valve means from one of said positions to the other position after said carriage has attained a desired carriage velocity.

4,204,406

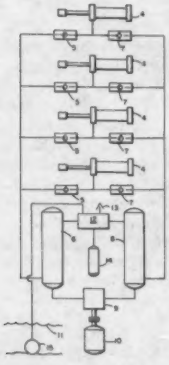
WAVE ENERGY MODULE 2

Harold H. Hopfe, 65 Pioneer Dr., Longmeadow, Mass. 01106

Continuation-in-part of Ser. No. 935,586, Aug. 21, 1978, abandoned. This application Jan. 15, 1979, Ser. No. 3,744

Int. Cl.² F03B *13/12*; E02B *9/08*; F15B *1/02*

U.S. Cl. 60—398 **18 Claims**



1. A device for efficiently extracting hydrodynamic energy from ocean waves, comprising a floating platform structure, an anchoring means which is connected to piston shafts of an array of hydraulic cylinders having pistons therein within the platform structure which act through a network of check valves as piston pumps for transferring hydraulic fluid from an air cushioned low pressure reservoir to an air cushioned high pressure reservoir, a sea condition monitor and intelligent controller which regulates the air cushion pressure in the reservoir tanks so that optimum energy conversion efficiency is achieved for any given sea condition, and a hydraulic motor or turbine mechanically coupled to an electric generator and hydraulically connected between the two reservoir tanks which produces electricity as fluid is allowed to flow through the motor or turbine from the high pressure reservoir to the low pressure reservoir.

4,204,407

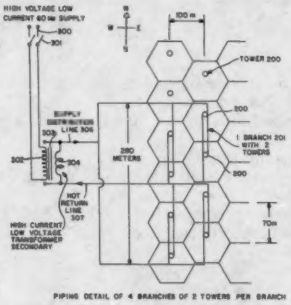
HEATED PIPING SYSTEM FOR FUSIBLE SALT HEAT EXCHANGE FLUID IN A SOLAR POWER PLANT

Otto J. M. Smith, 612 Euclid Ave., Berkeley, Calif. 94708

Filed Jun. 16, 1978, Ser. No. 916,462

Int. Cl.² F03G *7/02*

U.S. Cl. 60—641 **2 Claims**



PIPING DETAIL OF 4 BRANCHES OF 2 TOWERS PER BRANCH

1. In a solar electric power plant having a plurality of solar heat receptors using as a heat exchange fluid a material which is a solid at normal ambient temperatures the invention comprising: a piping system interconnecting said heat receptors having discrete supply and return lines for carrying said material and which are electrically insulated from one another said piping being electrically conductive having a relatively low resistance; and a power source for impressing a low voltage across said supply and return lines for causing the resistance of said piping to provide an ambient temperature above the melting point of said material.

4,204,408

VACUUM COOLING

Peter Dawson, Burnley, England, assignor to Tweedy of Burnley Limited, Burnley, England

Filed Jun. 19, 1978, Ser. No. 916,787

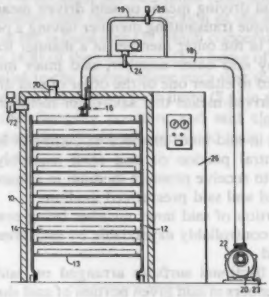
Claims priority, application United Kingdom, May 12, 1978, 19104/78

Int. Cl.² A01K *43/00*; F26B *21/06*; F25B *19/00*

U.S. Cl. 62—62 **17 Claims**

1. A method of cooling a moisture-containing foodstuff article comprising placing the article in a chamber and evacu-

ating said chamber to reduce the pressure of the atmosphere in said chamber so that moisture is given off by the article, and



controlling the evacuation of said chamber in response to dimensional change of the article during cooling.

4,204,409

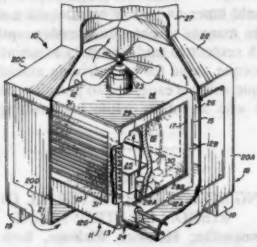
AIR CONDITIONING APPARATUS AND SYSTEM

Kauko K. Satama, 245 N. 87th St., Mesa, Ariz. 85207

Filed Jul. 26, 1978, Ser. No. 928,296

Int. Cl.[2] F25D *23/00*; F25B *27/02*; F28D *5/00*

U.S. Cl. 62—271 **5 Claims**



1. An apparatus for air conditioning the interior of a building comprising:

a refrigeration appartus comprising a first coil for the movement of a refrigerant therethrough and a fan motor for directing a stream of atmospheric air over said first coil for cooling the refrigerant,

a pair of spaced axially arranged chambers,

means for providing an air inlet port in the surface of one of said chambers and an air outlet port in the surface of the other of said chambers,

the inner chamber of said pair of chambers being provided with at least one opening covered by a fibrous material,

means for selectively wetting said fibrous material with water,

a second coil connected to said first coil and juxtapositioned to and downstream of said fibrous material for conducting the refrigerant from said first coil therethrough in a closed circuit configuration,

air movement means connected to said apparatus for directing said air passing over said first coil into one of said chambers, through said fibrous material and over said second coil out said outlet port,

said air being cooled by water evaporation when passing through said fibrous material, and

means for directing said air cooled by water evaporation between the interior and exterior walls of a building to reduce the temperature of these walls.

4,204,410

STEAM JET REFRIGERATION PLANT

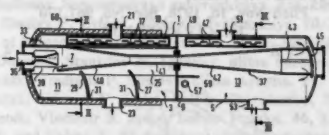
Adolf Kunz, Ettlingen, Fed. Rep. of Germany, assignor to Wiegand Karlsruhe GmbH, Ettlingen, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,369

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757748

Int. Cl.[2] F25B *1/06*

U.S. Cl. 62—500 **10 Claims**



1. In a steam jet cooling apparatus for cooling liquids, including: and expansion chamber into which is fed the liquid to be cooled and out of which is drawn the liquid that has been cooled; at least one steam jet compressor the suction side of which is connected to said expansion chamber; a condensation chamber which is connected to the pressure side of said steam jet compressor; which steam jet compressor, expansion chamber and condensation chamber are arranged in a common, horizontally extending vessel, which vessel is divided by a partition into said expansion chamber and said condensation chamber, the steam jet compressor penetrating and extending through said partition; the improvement which comprises in combination a manifold within said vessel for the inlet of the liquid to be cooled, positioned above said steam jet compressor and extending generally parallel to the longitudinal axis of the vessel; and, a divider plate disposed between the manifold and the steam jet compressor to shield the steam jet compressor against the liquid to be cooled flowing out of the manifold.

4,204,411

HOMOKINETIC TRANSMISSION

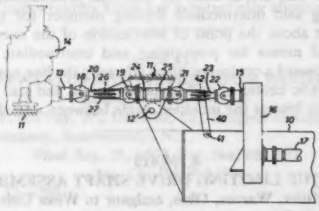
René H. Jeanson, Auzay, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Jun. 15, 1978, Ser. No. 915,885

Claims priority, application France, Jun. 23, 1977, 77 19278

Int. Cl.[2] F16C *1/02*; B60D *1/00*

U.S. Cl. 64—2 P **8 Claims**



1. A substantially homokinetic transmission for location between a first shaft carried by a first support whose position is fixed, and a second shaft having a variable inclination in relation to the first and which is carried by a second support whose position is variable, one of these shafts being the driving shaft and the other the driven shaft, the transmission comprising a first pair of universal joints associated with the first shaft, which universal joints are connected by a rotationally fixed connection of variable length, a second pair of universal joints associated with the second shaft, which universal joints are connected by a second rotationally fixed connection of variable length, and an intermediate shaft of fixed length interposed between the two pairs of universal joints, the said intermediate shaft being carried by a third support which is

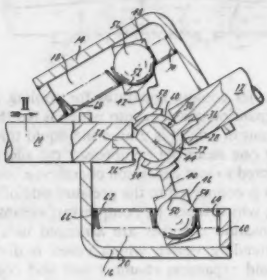
mounted for pivoting about an axis carried by the first support, and control means for controlling the position of the intermediate shaft at any given time in relation to the position of said second shaft of variable inclination.

4,204,412

CONSTANT VELOCITY UNIVERSAL JOINT

Donald L. Carriere, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 16, 1978, Ser. No. 961,170
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—17 R **4 Claims**



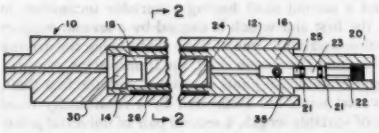
1. A constant velocity universal joint for transferring rotary motion from a driving shaft to a driven shaft wherein one shaft is adapted to be displaced angularly with respect to the other, a driving yoke carried by one end of said driving shaft, a driven yoke carried by one end of said driven shaft, an internal cam guide slot formed in each yoke, an intermediate driving member located between said one end of said driving shaft and said one end of said driven shaft, at least one circular bearing element carried by said intermediate driving member, said intermediate driving member being positioned such that its principal plane passes through the point of intersection of the axis of said shaft, said rotary bearing elements being received in said guide slots, the latter extending in the direction of the axes of their respective shafts, a universal spherical bearing means connecting together said one end of said driving shaft with said one end of said driven shaft for universal articulation and for journalling said intermediate driving member for universal movement about the point of intersection of the axes of said shafts, and means for positioning said intermediate driving member toward a central position whereby the line connecting the geometric center of said bearing element and said point of intersection bisects the included angle between said shafts.

4,204,413

TORQUE LIMITING DRIVE SHAFT ASSEMBLY

Paul W. Miller, Warren, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1977, Ser. No. 849,191
Int. Cl.[2] F16D *7/00*
U.S. Cl. 64—30 E **5 Claims**



1. A torque transmitting and regulating drive shaft assembly employable in a mechanical direct driving system wherein the assembly is connected to a rotatable driving means and a rotatable driven means and wherein the assembly in operation is subjected to detrimental mechanical accumulated strain, such as torque wind up, said drive shaft assembly comprising:

an outer torque transmitting member being connected to either said driving means or said driven means,

an inner torque transmitting member having a portion that is received in the outer member in a manner to drive or be driven by said outer member, said inner member being connected to either one or the other of said driving means or said driven means that said outer member is not connected to,

an opening in said inner member extending at least into the axial central portion of said shaft assembly, and constructed to receive pressure medium in a manner to pressurize and seal said pressurized medium,

a given portion of said inner member being constructed so that it is controllably expandable by said pressurized medium, and

contacting frictional surfaces arranged on said inner and outer members in said given portion of said shaft assembly in a manner to transmit rotatable working torque between said members and wherein the thermal coefficient of expansion of said inner member and the thermal expansion of said pressure medium is always less than the thermal coefficient of expansion of said outer member,

said outer member having strength and impact characteristics substantially equal to said inner member and constructed and arranged to be unrestrained as far as its ability to radially outwardly expand and during operation said inner and outer members are continuously subjected to the stresses of said expansion, said working torque, and torque windup, and while so subjected, to control the heat generated thereby,

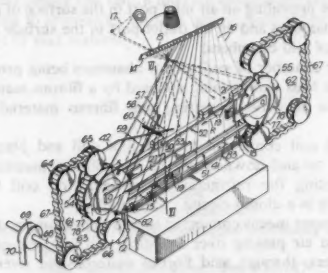
whereby said inner and outer members are self-compensating in the manner to obtain a pressure equilibrium condition with respect to said members to maintain a predetermined torque value for said driving assembly, and when said torque value is exceeded to permit relative movement between said members while transmitting the required torque.

4,204,414

CLAMPING MEANS FOR MATERIAL IN THREAD, RIBBON OR STRIP FORM

Antonius Vinnemann; Heinrich Elsässer, both of Stuttgart; Manfred Walter, Grötzingen, and Willi Gaiser, Gäufelden, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Fed. Rep. of Germany

Filed Oct. 31, 1978, Ser. No. 956,415
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748841
Int. Cl.[2] D04B *35/00*
U.S. Cl. 66—145 R **18 Claims**



1. Clamping means having a clamping position and an open position for clamping and releasing material in thread, ribbon or strip form as fed to a textile machine of the group including knitting and weaving machines, characterized by an element bent U-wise and resiliently in a first plane and having two arms

(2,3) of substantially equal length, the end (4) of the first arm (2) being bent back U-wise in a second plane in such a manner that the gap (7) between the two limbs (5,6) obtained by this bending is smaller than the cross section of the portion of the free end (8) of the second arm (3) which cooperates therewith, and the ends (4,8) of the two arms (2,3) being offset from one another parallel to the second plane such that the free end (8) of the second arm (3) engages both limbs (5,6) in the area of the gap (7) in the clamping position, and said element having means for mounting it on an associated part of the textile machine.

4,204,415

PROCESS AND APPARATUS FOR CONTINUOUSLY TRANSFORMING A STRIP TO AN ELONGATED PIPE

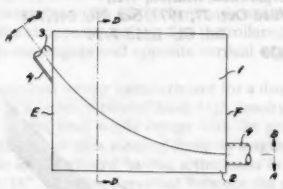
Poul E. Braad, Birkerod; Knud B. Jensen, Skodsborg; Hans Rosendal, Glostrup, and Flemming Sevaldsen, Copenhagen, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-og Traadfabriker, Copenhagen, Denmark

Filed May 11, 1978, Ser. No. 905,070

Claims priority, application Denmark, May 13, 1977, 2103/77

Int. Cl.[2] B21D *5/10, 51/00*

U.S. Cl. 72—52 **8 Claims**



1. In a process for continuously transforming a flat metal strip into an elongated pipe, by feeding the strip along a curved forming path between opposed portions of a forming tool and causing the strip to enter the forming tool at one end in a substantially flat condition throughout its width and progressively turning up longitudinal edge portions of the strip into cross-sectionally arcuate portions leaving between them a substantially cross-sectionally rectilinear section the width of which decreases during the travel of the strip through the forming tool, the improvement which comprises effecting said progressive turning up of said edge portions by using forming tool having at least one pair of opposed portions with guide faces defining the curved forming path, said guide faces having a radius of curvature R(z) in the longitudinal direction and having arcuate end portions in the transverse direction, said end portions having a radius of curvature r_0 and being interconnected by a rectilinear portion of a width 2x(z), where z is distance of travel through the tool, for controlling said radius of curvature R(z) in sole dependence on r_0 and the differential quotient x'(z), as the strip is fed along said curved forming path to substantially completely eliminate relative differences in travel distance between arbitrary areas in a transverse cross-section of the strip forming the pipe without plastic deformation of said strip in the longitudinal direction.

4,204,416

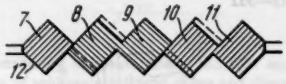
METHOD OF ROLLING SECTION BILLETS

Julian M. Chumanov, ulitsa Rozy Ljuxemburg, 65, kv. 33; Vyacheslav F. Gubaidulin, ulitsa Schorsa, 23, kv. 16; Grigory M. Shulgin, ulitsa Izjumovskaya, 5, kv. 232, all of Donetsk; Viktor I. Pogorzhelsky, Mironovskaya ulitsa, 26, kv. 57; Vasily P. Morozov, ulitsa Leninskaya, 42, kv. 64, both of Moscow; Pavel A. Levichev, ulitsa Orbyty, 152; Jury P. Lyashenko, Universitetskaya ulitsa, 58, kv. 53, both of Donetsk; Anatoly G. Shalimov, Semenovskaya naberezhnaya, 3/1, korpus 6, kv. 218; Dmitry P. Evteev, ulitsa Chelyabinskaya, 10/2, kv. 137, both of Moscow; Sergei P. Efimenko, bulvar Pushkina, 25, kv. 34, Donetsk; Stanislav N. Ignatiev, ulitsa Saratovskaya, 24, Donetsk; Vladimir P. Slednev, ulitsa Artema, 147 V, kv. 35, Donetsk; Eduard V. Ovsy, bulvar Shevchenko, 19, kv. 32, Donetsk; Vladimir S. Solod, bulvar Franko, 46, kv. 69, Donetsk, and Valery V. Moiseenkov, ulitsa Postysheva, 135, kv. 24, Donetsk, all of U.S.S.R.

Filed Dec. 20, 1977, Ser. No. 862,642

Int. Cl.[2] B21B *1/02*

U.S. Cl. 72—204 **6 Claims**



1. A method of rolling section billets having opposing sides from a slab using milling rolls with multipass grooves and having roll axes transverse to the billets comprising: successively forming a plurality of adjacent billets transversely interconnected by bridges in a number of grooves defined by a plurality of transversely juxtaposed passes; and separating said billets from one another by effecting a relative displacement by an amount at least equal to the bridge thickness between said adjacent billets by acting with a groove of a milling roll on one of the sides of said adjacent billets at an angle to the roll axis other than 90° after the thickness of said bridge becomes equal to 0.01–0.3 of the height of said groove and said adjoining portions of said adjacent billets constituting extensions of one another and being in a straight line and defining the bridges, serve as pilot surfaces for the relative displacement along shearing planes, and the separation of said billets being accomplished by shearing forces transmitted through one side of a billet with the side of another adjacent billet acting as a guide support; and whereby burrs are substantially eliminated.

4,204,417

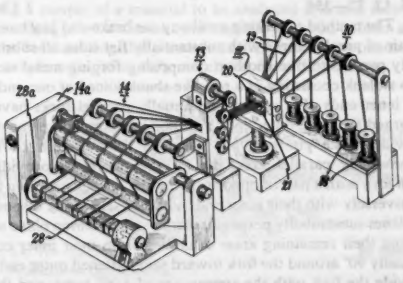
APPARATUS AND METHOD FOR WINDING ELECTRICAL COILS

Charles F. McVoy, Jr., Danville, Ill., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,167

Int. Cl.[2] B21F *3/04*

U.S. Cl. 72—206 **17 Claims**



1. Apparatus for winding a plurality of coils of rectangular

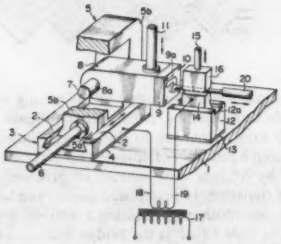
wire from round wire comprising, in combination, supply means for supplying a plurality of round wire strands, first flattening means for receiving said plurality of round wire strands and flattening two opposite sides thereof, second flattening means for receiving the thus-flattened wire strands in side-by-side arrangement and flattening four sides thereof to form the same into rectangular wire strands, and coil winding means for receiving said rectangular wire strands and simultaneously winding the same into a plurality of coils.

4,204,418

MACHINE AND METHOD FOR ELECTRIC FORGING OF THE END OF A METALLIC STICK IN A PLANE GENERALLY PERPENDICULAR TO THE STICK

Toraji Mochizuki, Tokyo, Japan, assignor to Nippon Dentan Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,777
Int. Cl.² B21J 9/08
U.S. Cl. 72—352 **3 Claims**



1. A method for making a head on the end of a metallic stick by electric forging, said head being of a shape generally extending in a plane perpendicular to the stick, comprising:

pushing a metallic stick in its axial direction into a mold groove formed in a mold while the stick is softened by heat generated by its internal resistance by leading a current between the stick and the mold;

and moving the mold along two axes in the plane substantially perpendicular to the stick, thereby distributing the softened metal about in the mold groove, while the stick is not substantially moved except in its axial direction.

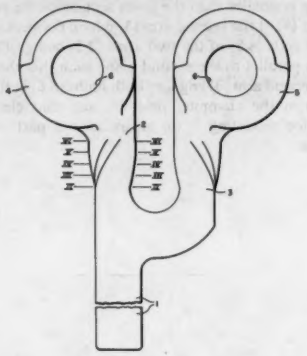
4,204,419

BRAKE-ROD JAW WITH TWISTED FORKS

Roland E. Cale, Cortland, Ohio, assignor to Schaefer Equipment Incorporated, Warren, Ohio

Filed Dec. 20, 1978, Ser. No. 971,199
Int. Cl.² B21K 1/74
U.S. Cl. 72—356 **1 Claim**

1. The method of making a railway car brake-rod jaw having a pair of parallel forks with substantially flat sides all substantially parallel to one another, comprising forging metal stock into a blank consisting of a rod-like shank joined at one end to the inner ends of a pair of substantially parallel forks having enlarged flattened outer ends disposed in a common plane and provided with pin-receiving openings therethrough having substantially parallel axes, the forging operation providing each fork with a pair of opposite sides that are substantially flat transversely with their inner ends adjacent said shank disposed in planes substantially perpendicular to said common plane and having their remaining areas extending from their inner ends helically 90° around the fork toward said flattened outer end to provide the fork with the appearance of a 90° twist, and then twisting the forks 90° on their axes in directions that will substantially eliminate said twisted appearance and will turn said enlarged ends into spaced parallel planes with their pin-receiving openings in axial alignment and with all of said flat sides straight and substantially parallel to one another.

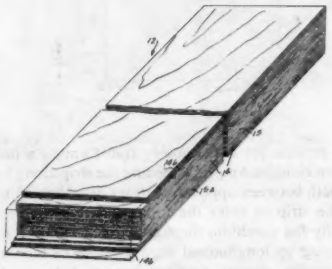


4,204,420

LAMINATED BOARD AND HAMMER COMBINATION FOR A DROP HAMMER FORGE

Thomas E. Rogers; Richard J. Rogers; Peter T. Rogers, and James G. Rogers, all of Marion, Wis., assignors to Marion Plywood Corporation, Marion, Wis.

Filed Oct. 27, 1977, Ser. No. 846,163
Int. Cl.² B21J 7/36
U.S. Cl. 72—439 **12 Claims**



1. In a drop forge hammer board press having lift roller means and a hammer, a laminated veneer hammerboard attachable at one end to the hammer and, engageable at an opposite end with the lift roller means, the improvement comprising the hammer board being comprised of a series of plies of hard, high density wood of the order of a peeled hard maple veneer with the grain of at least most of said veneer plies running along its length, each of said plies of the hammer board having a thickness in the range of 1/32" to 3/16", and glue deposited between the plies securing the plies together and providing a relatively large number of hard glue surfaces enhancing the wearability of of the board, vertical edges of each ply being disposed at opposite ends of the hammer board rather than along the width thereof thus enabling the roller means to engage opposite surfaces of the outermost ply on each side of the hammer board rather than directly against the vertical edges of each ply.

4,204,421

LAMINATED BOARD AND HAMMER COMBINATION FOR A DROP HAMMER FORGE

Thomas E. Rogers; Richard J. Rogers; Peter T. Rogers, and James G. Rogers, all of Marion, Wis., assignors to Marion Plywood Corporation, Marion, Wis.

Filed Oct. 27, 1977, Ser. No. 846,164
Int. Cl.[2] B21J *7/36*
U.S. Cl. 72—439 16 Claims

1. In a drop forge hammerboard press having lift roller means and a hammer, a hammerboard attached at one end to the ram and engageable at an opposite end with the lift roller means, the improvement comprising the hammerboard being comprised of a series of plies of hard, high density wood at least of the order of hard maple veneer with the grain of at least most of said veneer plies running along its length, each of said plies of the hammerboard having a thickness in the range of 1/32" to 3/16", and glue deposited between the plies securing the plies together and providing a relatively large number of hard glue surfaces enhancing the wearability of the board, said plies having opposite vertical edges extending vertically and disposed along the width of the hammerboard as opposed to being located at opposite ends so that the rollers on a hammerboard press can engage said opposite vertical edges of each of said plies.

15. A laminated veneer hammerboard for a drop forge press comprised of a series of plies of hard, high density wood of the order of a peeled hard maple veneer with the grain of at least most of said veneer plies running along its length, each of said plies of the hammerboard having a thickness in the range of 1/32" to 3/16", and glue deposited between the plies securing the plies together and providing a relatively large number of hard glue surfaces enhancing the wearability of the board, said plies having opposite vertical edges extending vertically and disposed along the width of the hammerboard as opposed to being located at opposite ends so that rollers on a hammerboard press can engage said opposite vertical edges of each of said plies, said board having 42 glue lines having an aggregate of 420 thousandths-of-an-inch of glue line on which the rollers can run when engaged against opposite vertical edges of each ply disposed along the width of the board.

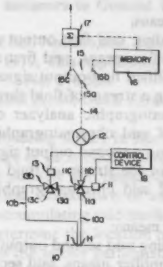
4,204,422

PRESSURE MEASURING DEVICE

Yuichiro Inoue, Mitaka, and Masamichi Sakaki, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 10, 1979, Ser. No. 37,954
Claims priority, application Japan, May 19, 1978, 53-58867
Int. Cl.[2] G01L *27/00*
U.S. Cl. 73—4 R 5 Claims

1. In a pressure measuring device comprising a main solenoid valve having a first valve opening connected to a branch pipe diverging from a pipe through which a fluid to be measured flows and further having second and third valve openings, and a pressure transducer connected to the second valve opening of said main solenoid valve, whereby the pressure of the fluid inside said pipe is measured, the improvement which comprises an auxiliary solenoid valve having a first valve opening connected to the third valve opening of said main solenoid valve and a second valve opening to which a reference pressure is applied, a control circuit to produce a solenoid valve driving signal for connecting in inspection the second and third valve openings of said main solenoid valve and the first and second valve openings of said auxiliary solenoid



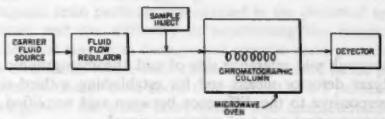
valve, and connecting in measurement the first and second valve openings of said main solenoid valve and disconnecting the first and second valve openings of said auxiliary solenoid valve, and a means for correcting an output signal from said pressure transducer corresponding to the measured fluid pressure in accordance with an output signal from said pressure transducer corresponding to the reference pressure at inspection.

4,204,423

CHROMATOGRAPH

John H. Jordan, Beaumont, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,882
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 6 Claims



1. A chromatograph apparatus which comprises a column of a material selected from the group consisting of glass, plastic and ceramic which material does not reflect microwave radiation, said column being located within an area defined by side walls, a top wall, a bottom and a door, all of which are made of materials which reflect microwaves, microwave means for heating said column, a carrier fluid, means for establishing a flow of said carrier fluid through said column, means for introducing a sample of a material to be analyzed into said flow of carrier fluid prior to the entry of the fluid into said column and means for detecting the presence of separated components of the sample material as they are eluted from the column.

4,204,424

CHROMATOGRAPHIC ANALYZER DETECTOR GAIN ADJUSTMENT

Starnes E. Walker, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 8, 1979, Ser. No. 1,980
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 10 Claims

1. Apparatus comprising:
a chromatographic analyzer detector means capable of mea-

suring a property of a fluid which is characteristic of the fluid, said chromatographic analyzer detector means having a reference side and a sample side;

means for passing a stream of fluid through the reference side of said chromatographic analyzer detector means, said reference side of said chromatographic analyzer detector means providing a first output signal representative of said property of the stream of fluid flowing through the reference side of said chromatographic analyzer detector means;

first amplifier means;

means for providing said first output signal as an input to said first amplifier means, said first amplifier means providing an amplified first output signal as an output;

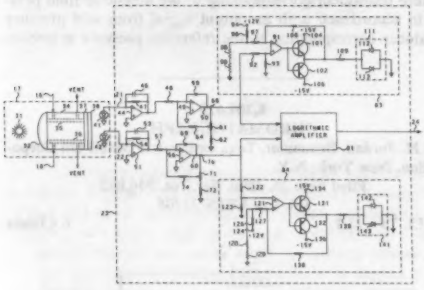
means for passing a stream of fluid through the sample side of said chromatographic analyzer detector means, said sample side of said chromatographic analyzer detector means providing a second output signal representative of said property of the stream of fluid flowing through the sample side of said chromatographic analyzer detector means;

second amplifier means;

means for providing said second output signal as an input to said second amplifier means, said second amplifier means providing an amplified second output signal as an output;

means for establishing a reference signal;

means for comparing said amplified first output signal and said reference signal when a first stream of fluid is flowing



through said reference side of said chromatographic analyzer detector means and for establishing a third signal responsive to the difference between said amplified first output signal and said reference signal;

a first light-emitting diode means;

means for supplying said third signal to said first light-emitting diode means, said first light-emitting diode means emitting a first color when said amplified first output signal is greater than said reference signal, said first light-emitting diode means emitting a second color when said amplified first output signal is less than said reference signal, said first light-emitting diode means emitting substantially no light when said amplified first output signal is substantially equal to said reference signal;

means for adjusting the gain of said first amplifying means until substantially no light is emitted from said first light-emitting diode means;

means for comparing said amplified second output signal and said reference signal when said first stream of fluid is flowing through said sample side of said chromatographic analyzer detector means and for establishing a fourth signal responsive to the difference between said amplified second output signal and said reference signal;

a second light-emitting diode means;

means for supplying said fourth signal to said second light-emitting diode means, said second light-emitting diode means emitting a first color when said amplified second output signal is greater than said reference signal, said second light-emitting diode means emitting a second color when said amplified second output signal is less than said reference signal, said second light-emitting diode means emitting substantially no light when said amplified second output signal is substantially equal to said reference signal; and

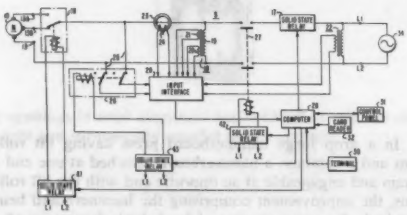
means for adjusting the gain of said second amplifying means until substantially no light is emitted from said second light-emitting diode means.

4,204,425

METHOD OF TESTING INDUCTION MOTORS

George T. Mallick, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1978, Ser. No. 920,320
Int. Cl.[2] G01L *3/22*
U.S. Cl. 73—116 **19 Claims**



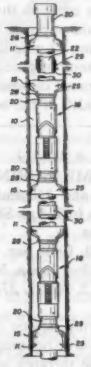
1. A method of testing an induction motor which comprises providing an alternating current power supply of the voltage and frequency on which the motor is intended to operate, applying said power supply to the motor is an unloaded condition at a known speed of rotation of the motor, interrupting the power supply after a first predetermined time period before the motor has reached running speed, immediately measuring the instantaneous speed of rotation of the motor, and determining the motor torque using the change in speed.

4,204,426

MEASURING CASING COUPLER APPARATUS

Franklin D. Patton, West Vancouver, and James D. McFarlane, Vancouver, both of Canada, assignors to Westbay Instruments Ltd., West Vancouver, Canada

Filed Nov. 13, 1978, Ser. No. 959,842
Int. Cl.[2] E21B *49/00*
U.S. Cl. 73—151 **14 Claims**



1. Measuring casing apparatus through which can be moved instruments for taking measurements and/or samples from the surrounding environment at one or more predetermined levels,

said instruments having laterally extending depressible stop arms, said apparatus comprising

a plurality of axially aligned measuring casings,

at least one coupler tube having opposite open ends registering with and connected to ends of adjacent measuring casings, said coupler tube being located at a predetermined level when said casing apparatus is in operation, the interior of the coupler tube forming a common passageway with the interiors of said casings through which instruments can be moved to take measurements or samples, and

stop means on the coupler tube at a side of said passageway and so positioned as to be engaged by an extended stop arm of an instrument moving through the passageway to stop said instrument in a desired position for taking measurements and/or samples, said stop means allowing unimpeded movement of the instrument through the passageway when the stop arm of the instrument is depressed.

4,204,427
DEVICE FOR THE CAPACITIVE LEVEL HEIGHT MEASUREMENT OF LIQUIDS OR SOLIDS

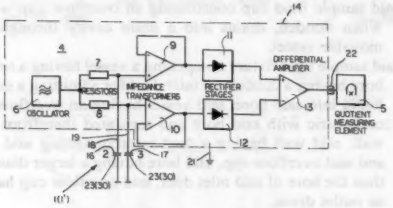
Diethard Gothe, North Eltham; Jeffrey J. Nuske, Diamond Creek, and Jürgen Friedrich, Ringwood, all of Australia, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,531

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824144

Int. Cl.[2] G01F *23/26*; G01R *27/26*

U.S. Cl. 73—304 C **10 Claims**



1. A device located in motor vehicle tanks for the level measurement of liquid in a motor vehicle tank, comprising

a capacitive measuring sensor disposed in said tank immersed at least partially in the liquid comprising

an elongated insulating material plate with at least one electrode thereon, said insulating material plate having longitudinal edges,

a U-profile shaped carrier electrode made of a sheet metal strip, longitudinal ends of said U-profile shaped carrier electrode forming legs thereof fastened to said insulating material plate in the vicinity of said edges,

said at least one electrode on said elongated insulating material plate is arranged longitudinally parallel to said carrier electrode,

at least one conducting layer in the vicinity of said edges being on said insulating material plate,

said at least said one conducting layer facing toward said carrier electrode and being electrically connected with at least one of the legs of said U-shaped carrier electrode by the fastening of said carrier electrode to said insulating material plate in the vicinity of said edges,

a circuit chip module including evaluating circuit components having an oscillator, said module being mechanically connected to said insulating material plate of said measuring sensor,

an indicator instrument being electrically connected to said evaluating circuit components,

said evaluating circuit components being electrically connected to said at least one conducting layer of said insulating material plate and to said at least one electrode.

4,204,428
THERMAL DETECTION SYSTEM FOR FAILURE IN ELECTRICAL APPARATUS AND THERMAL DETECTING PAINT COMPOSITIONS

Jimmy L. Webb, Ballston Lake, and Woodfin V. Ligon, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 806,600, Jun. 15, 1977, and Ser. No. 807,067, Jun. 16, 1977. This application Feb. 9, 1978, Ser. No. 876,520

Int. Cl.[2] C09K *3/00*; G08B *21/00*; G01K *13/00, 1/00, 3/04, 3/08*

U.S. Cl. 73—339 R **15 Claims**

1. In a method for locating failure in electrical apparatus to prevent thermal damage in such electrical apparatus based on the use of a monitor suitable for detecting smoke particles arising from the thermal breakdown of an organic resin, a collecting means for accumulating said smoke particles, and an analytical means to determine the location of electrical failure based on an analysis of the smoke particulate, whereby uncertainty of the location of the electrical failure results due to the difficulty of clearly distinguishing the particulate arising from normal background electrical apparatus operation, from particulate arising from the site of electrical failure, the improvement which comprises,

(1) coating the electrical apparatus in at least two principal locations with thermal particulating organic paint compositions comprising a thermal particulating organic resin having a smoking temperature below 250° C. and a member of a set of identifying chemical tags resulting respectively in the deposition of a chemical tag for each preselected surface of the electrical apparatus,

(2) and when smoking occurs as a result of electrical breakdown, collecting organic resin particulate obtained from the collecting means and analyzing it as a solvent extract in a gas chromatograph equipped with an electron capture detector or a micro coulometric detector whereby a member of the total set of chemical tags utilized in the electric apparatus can be identified to establish the location of the organic resin particulate generated in the electrical apparatus, and the difficulty in establishing the respective chemical tags from background organic resin particulate is overcome, where each chemical tag is used in the paint composition at from about 0.01 percent to 0.5 percent by weight of the paint composition and characterized by having a volatility range equivalent to a C(24–45) aliphatic paraffin and selected from the class consisting of

(A) chemical tags selected from halogenated aromatic organic compounds and polyfluorinated aliphatic organic compounds capable of resisting decomposition at temperatures at least 100° C. higher than the smoking temperature of the thermal particulating organic resin and

(B) chemical tags in the form of halogenated aromatic amic acids which are convertible to halogenated aromatic organic compounds of (A) at smoking temperatures.

4,204,429
THERMOMETER USING A THERMO-SENSITIVE ELEMENT

Takaichi Shimazaki, Moroyama, and Katsuaki Hazome, Oume, both of Japan, assignors to Hitachi Iruma Electronic Company Ltd., Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,119

Claims priority, application Japan, Oct. 26, 1977, 52-127550

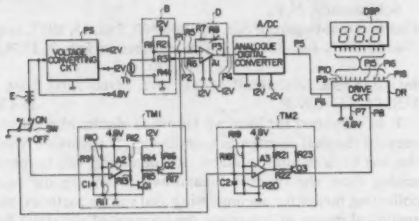
Int. Cl.[2] G01K *7/22*

U.S. Cl. 73—362 AR **10 Claims**

1. A thermometer using a thermo-sensitive element comprising:

a thermo-sensitive element operable to provide an electric output signal in response to the temperature thereof, said thermo-sensitive element having at least two terminals for providing the electric output signal therebetween in response to the change in the temperature thereof;

preheating means for raising the temperature of said thermo-sensitive element to a predetermined temperature in relation to the temperature of an object to be measured by



self-heating under energization of said thermo-sensitive element through said two terminals of the thermo-sensitive element; and

temperature measuring means for measuring the electric output signal of said thermo-sensitive element in response to said temperature of the object while the energization of said thermo-sensitive element from said preheating means is stopped.

4,204,430

AUTOMATIC LIQUID FLOW SAMPLING APPARATUS

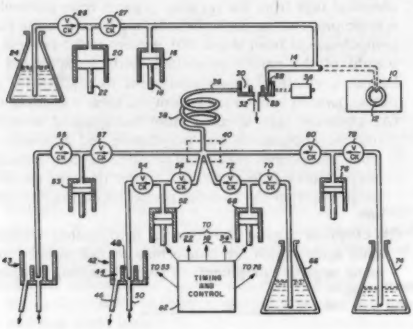
Rolf Tamm, Salem; Toma Tomoff, and Bernhard Huber, both of Uberlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,586

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704239

Int. Cl.[2] G01N *1/14*

U.S. Cl. 73—423 A **10 Claims**



1. Apparatus for the continuous and automatic sampling and conveying of fluids to an analytical instrument, said apparatus including:

a movable vessel having therein a flushing cup and a sample fluid cup;

an intake and dispensing tube having an apertured tip movable between a first position in said flushing cup and a second position in the sample input port of the analytical instrument;

first means for moving said vessel whereby the positions of said sample fluid cup and said flushing cup are exchanged;

second means for moving said intake and dispensing tube tip between said first and second positions;

a first pump coupled to said intake and dispensing tube for drawing and discharging a fluid through said tube;

a second pump coupled to said intake and dispensing tube and to a source of flushing fluid for discharging said flushing fluid through said tube;

a third pump coupled to a fluid sampling fixture and to a conduit entering the bottom of said sample fluid cup of said movable vessel for admitting a sample of fluid to said sample fluid cup; and

timing and control means coupled to said first means, said second means, said first pump, said second pump and said third pump for sequentially pumping fluid into said sample fluid cup, drawing a sample into said intake and dispensing tube, moving said tube from its first position to its second position, aspirating said tube, moving said movable vessel, returning said tube tip to said flushing vessel, pumping flushing fluid through said tube, lifting said tube, moving said vessel, and lowering said tube tip into said sample fluid cup,

a fourth pump coupled to said sample fluid cup and to a source of a calibration fluid, said timing and control means controlling the operation of said fourth pump to introduce said calibration fluid into said sample fluid cup at predetermined intervals for calibration of said analytical instrument,

a fifth pump coupled to said sample fluid cup and to a source of a sample fluid dilutant, said timing and control means controlling the operation of said fifth pump to introduce said dilutant in a predetermined quantities simultaneously with samples of fluid to be analyzed,

said sample fluid cup constituting an overflow cup which, when flooded, drains into a drain cavity through said movable vessel,

said sample fluid fixture comprising a vessel having a tubular bore having a concentric inlet duct for admitting a sample liquid into said bore, said vessel having an overflow cup concentric with said bore and separated therefrom by a wall, said wall having a duct interconnecting said bore and said overflow cup, said bore having a larger diameter than the bore of said inlet duct, said overflow cup having an outlet drain.

4,204,431

DEVICE FOR TEMPERATURE MEASUREMENT AND SAMPLING OF A STEEL

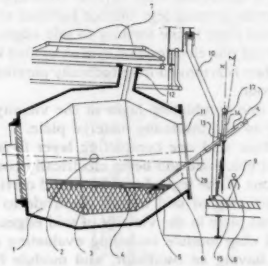
Herbert Schulz, Rosenheim, France, assignor to Creusot-Loire Enterprises, Courbevoie la Defense, France

Filed Dec. 13, 1978, Ser. No. 969,056

Claims priority, application France, Dec. 29, 1977, 77 39548

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—423 R **15 Claims**



1. A device for temperature measurement and sampling of a molten steel bath in a converter having a working platform adjacent thereto, the measurement and sampling being effected

when said converter is in a position inclined towards said platform, said device comprising:

support means suspended above said working platform in spaced relation therewith;

a carriage;

means mounting said carriage on said support means for movement horizontally relative thereto;

drive means for moving said carriage on said support means;

a telescopic jack comprising a plurality of telescopic elements;

means mounting said jack on said carriage for pivotal movement relative thereto in a vertical plane;

drive means for pivoting said jack on said carriage;

a measurement rod mounted on the end one of said telescopic elements in alignment therewith;

a probe means for temperature measurement and for sampling mountable at the end of said measurement rod;

remote control means for actuating said jack, and for actuating said drive means of said jack and of said carriage; and

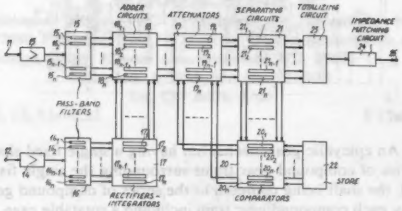
at least one protective sliding door extending above said platform and facing said converter, said telescopic jack having a vertical rest position above said platform and adjacent said door on the side thereof remote from said converter.

4,204,432

ACOUSTIC INSULATION MEASUREMENT APPARATUS

Jean Pujolle, Paris, and Patrice Bourcet, Franconville-la-Garenne, both of France, assignors to Telediffusion de France, Paris, France

Filed Feb. 21, 1979, Ser. No. 13,444
Claims priority, application France, Feb. 24, 1978, 78 05372
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—599 **3 Claims**



1. A device enabling the direct measurement of the overall insulation level of an acoustic insulation medium with respect to a reference excitation noise signal when said medium is subject to an actual excitation noise signal deviating from the reference excitation noise signal, the said device comprising:

first input means receiving a first alternating electrical signal representing the noise signal actually transmitted through said medium;

second input means receiving a second alternating electrical signal representing the actual excitation noise signal;

a read only memory storing spectral components of the reference excitation noise signal in given spectral bands;

means for decomposing the first and the second alternating signals into alternating spectral components in the same spectral bands;

means for rectifying the spectral components of the second signal in order to obtain rectified spectral components;

means for adding said rectified spectral components of the second signal and said alternating spectral components of the first signal relating to the same spectral bands in pairs so that composite signals are obtained;

means for selectively attenuating said composite signals;

means for separating in the attenuated composite signals the attenuated alternating spectral components and the attenuated rectified spectral components;

means for comparing the attenuated rectified spectral components to the spectral components of the reference excitation noise signal relating to the same spectral bands and for deriving therefrom error signals respectively corresponding to said spectral bands; and

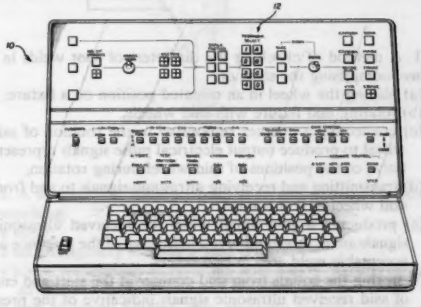
means for controlling said attenuating means by said spectral band error signals.

4,204,433

COMPUTERIZED ULTRASONIC SCANNER WITH TECHNIQUE-SELECT

Robert W. Cribbs, Placerville, and John E. Mahony, Sacramento, both of Calif., assignors to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Nov. 7, 1977, Ser. No. 848,988
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—620 **6 Claims**



1. In an ultrasonic diagnostic system of the type including ultrasonic pulse generating means for applying a series of pulses to the surface of a body for propagation therethrough, detecting means for detecting pulse reflections and responsive to the emergence of reflected pulses from the body for producing a respective incoming signal indicative of a discontinuity in the propagation path, and

video display means for producing a visual representation of the media defining the propagation path, the improvement comprising:

operator-actuable means for producing a control signal related to a selected one of a plurality of signal processing techniques which condition the incoming signal for video displaying;

memory means for storing information related to the signal processing techniques;

memory access means responsive to the unique control signal for obtaining the stored information related to the selected technique;

circuit means for quantizing the amplitude of the incoming signal in accordance with the information accessed by the access means and for producing a first signal indicative thereof;

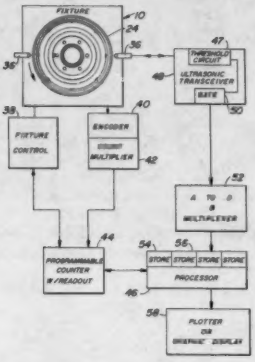
means receiving the first signal and responsive to the access means in accordance with the accessed information for selectively producing as a processed video signal either the first signal or a signal representing the subtracting of time-delayed portion of the first signal level from the instantaneous level of the data signal to produce.

4,204,434

ULTRASONIC TESTING OF WELDS IN WHEELS

Jay F. Whitsel, Southampton, Pa., assignor to The Budd Company, Troy, Mich.

Filed Dec. 18, 1978, Ser. No. 970,156
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—622 **11 Claims**



1. A method of checking the diameters of spot welds in a wheel comprising the steps of:

(a) placing the wheel in an oriented position on a fixture;

(b) rotating said fixture with said wheels,

(c) connecting a counter responsive to the rotation of said wheel to produce output electrical pulse signals representative of the positions of said wheel during rotation,

(d) transmitting and receiving ultrasonic signals to and from said wheel as it is rotated,

(e) producing a gate signal when the received ultrasonic signals are at threshold levels indicative of the presence an acceptable weld area in said wheel,

(f) storing the counts from said counter at the start and end of said received ultrasonic signals indicative of the presence of said acceptable areas and,

(g) utilizing the stored counts from said counter to provide indications of the diameters of said spot welds.

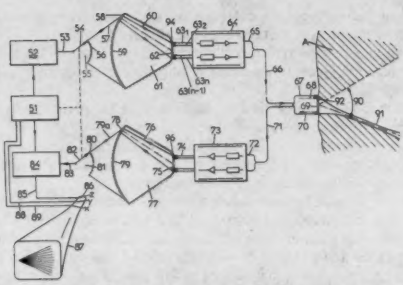
4,204,435

DEVICES USING ULTRASOUNDS FOR FORMING IMAGES, IN PARTICULAR FOR THE INTERNAL EXAMINATION OF THE HUMAN BODY

Edouard Bridoux, Maing; Christian Bruneel, Marly; Francis Haine, and Guy Thomin, both of Valenciennes, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Sein, France

Filed Apr. 27, 1978, Ser. No. 900,665
Claims priority, application France, Apr. 29, 1977, 77 12994; Apr. 17, 1978, 78 11274
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—626 **4 Claims**

1. A device for forming images through ultrasonic echography comprising in known manner one or two series of individual transducers transmitting, in response to triggering electric signals, ultrasonic signals towards an object to be examined and/or transforming receiving ultrasonic signals into electric signals, means for applying triggering electric signals to the single series of transducers or to the series providing transmission of ultrasonic signals, and means for forming an image from the electric signals supplied by the single series of transducers or the series of transducers receiving the ultrasonic signals, wherein the single series or each series of transducers is arranged along a curved band in such manner as to direct the ultrasonic rays, for the transmission as well as for the reception, through a reduced area surrounding the center of curvature of the curved band or of each curved bad, and at least one electronic lens formed by a first array of ultrasonic transducers arranged in the vicinity of the center of curvature of the



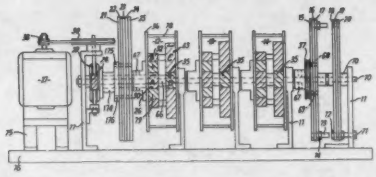
curved band or of each curved band, by differential delay electronic means and by a second ultrasonic transducers array.

4,204,436

IMPROVEMENTS IN OR RELATING TO EPICYCLIC GEAR MECHANISM

Harry Heaton, 318 Gerald Rd., Pendleton, Salford M6 6AZ, England

Filed Jun. 27, 1977, Ser. No. 810,383
Int. Cl.[2] F16H *57/10*
U.S. Cl. 74—767 **13 Claims**



1. An epicyclic gear mechanism having a single fixed shaft; a series of compound gear trains surrounding the single fixed shaft, the shaft being common to the series of compound gear trains, each compound gear train including a rotatable cage, at least two planet gears of compound form on the cage and rotatable relative to the cage, a stationary gear operably associated with one gear of the compound planet gear, and an output gear operably associated with the other gear of the compound planet gear, said output gear being rotatable on the fixed shaft relative to the cage and connected to a gear or an input means of a successive compound gear train, each successive gear train in the series providing a stepwise increase in output speed; and a final output means for defining a gear operably associated with one gear of the last compound planet gear of the last compound gear train of the series, said final output gear being rotatable around said fixed shaft and being attachable to an output device.

4,204,437

FRICTION BEARING ROCK BIT AND SEGMENT, AND METHOD FOR MAKING THEM

Salvador Espana, Costa Mesa, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

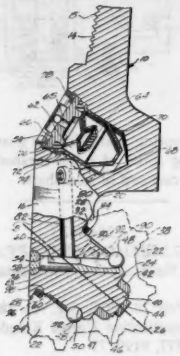
Filed Apr. 3, 1978, Ser. No. 893,196
Int. Cl.[2] B21K *5/02*; C21D *1/78*
U.S. Cl. 76—108 A **28 Claims**

1. In a method for forming a drill bit segment of the friction bearing type for use in a rotary rock bit, the segment having a journal for mounting a rotary cutter, the journal having areas

requiring hardening, and machined areas other than the journal, an improvement in the carbon enrichment and heat treating of the segment comprising the steps of:

(a) completing the machining of the segment;

(b) carbon enriching the entire segment surface at an elevated temperature in a carbon enriched atmosphere to



develop a case on the segment, the elevated temperature being sufficient to effect hardening of the case upon quenching the segment; and

(c) quenching the segment directly from the elevated temperature to develop the desired hardnesses in the case and the core.

4,204,438

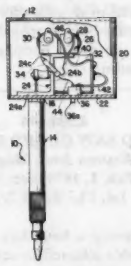
TATTOOING DEVICE

Christopher Binaris, 157 Brightwood Ave., Westfield, N.J. 07090; Patricia S. Volz, 74 Hoyt St., Darien, Conn. 06820, and Joseph Ohidy, 828 4th Ave., Westfield, N.J. 07090

Filed Jun. 2, 1978, Ser. No. 911,938

Int. Cl.[2] B43K *5/00*

U.S. Cl. 81—9.22 **8 Claims**



1. A tattooing device for performing a tattoo, comprising:

a motor housing and a needle housing secured to said motor housing,

said motor housing having mounted therein a motor and an eccentric drive structure driven by said motor,

a needle shaft and tattooing needle mounted for reciprocation in said needle housing and driven to reciprocate by said eccentric drive structure,

said needle housing having an opening at the lower end thereof through which said tattooing needle reciprocates, and

a bushing formed of noise reducing material mounted in the bottom section of said needle housing and having an internal opening through which said tattooing needle extends, the internal diameter of said bushing opening being less than the internal diameter of said needle housing opening so that said bushing operates to constrain transverse movement of said reciprocating needle and thereby reduces noise, ink splatter, and the tearing of skin and improves the line clarity of the tattoo produced.

4,204,439

HEAD FOR A POWER OPERATED SCREWDRIVER

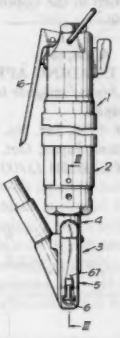
Hiroo Kondo, Maizuru, Japan, assignor to Nitto Seiko Co., Ltd., Kyoto, Japan

Filed Dec. 20, 1978, Ser. No. 971,417

Claims priority, application Japan, Dec. 28, 1977, 52-178492

Int. Cl.[2] B25B *23/02*

U.S. Cl. 81—57.37 **13 Claims**



1. A screwdriver having a head at an end thereof, the head comprising:

a body;

a bit passageway formed in said body;

a screw passageway intersecting with said bit passageway in an inclined manner;

a pair of screw holding jaws pivotally mounted across an end of said body;

spring means for biasing said holding jaws towards one another for holding screws admitted from said screw passageway in a driving position;

stop jaw mounting openings provided at an end of each of said holding jaws penetrating from the inside to the back side thereof;

stop jaws freely pivoted in each of said mounting holes in the same plane as the pivoting plane of the holding jaws; and

spring means for biasing said stop jaw towards one another.

4,204,440

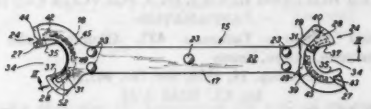
OPEN END ONE WAY TORQUE WRENCH

Cosimo Del Prete, and Michael V. Ferraro, both of 1048 W. Oakdale, Chicago, Ill. 60657

Filed Jul. 24, 1978, Ser. No. 927,282

Int. Cl.[2] B25B *13/28*

U.S. Cl. 81—111 **11 Claims**



1. An open end one way torque wrench having a handle body and a wrench head recess at least on one end of said body and receptive of a multifaced element to be torqued, and comprising:

a substantially semicircular track defined in said recess;

a jaw assembly having a pair of jaw members within said

recess and adapted to grip opposite parallel faces of the multifaced element to which torque is adapted to be applied;

means connecting said jaw members in end-to-end articulated relation to one another;

means for operatively retaining said jaw members in said recess and permitting oscillation of said jaw members with respect to said track;

and means for maintaining said jaw members in a rigid position, element face gripping relation when the wrench is swung in one rotary direction, and permitting oscillation movement away from said rigid position and into a separating release relation of said jaw members from the gripped faces of the element for shifting of the jaw members into engagement with other faces of the element upon swinging of the wrench in the opposite rotary direction.

4,204,441

WORKPIECE LOADING APPARATUS

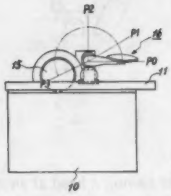
Makoto Kikuchi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 29, 1978, Ser. No. 947,045

Claims priority, application Japan, Oct. 8, 1977, 52-121069

Int. Cl.[2] B23B *13/00*

U.S. Cl. 82—2.5 **6 Claims**



1. An apparatus for loading a disk-like workpiece into a chuck mounted on a spindle head and rotated about a horizontal axis comprising:

a housing;

a swing arm supported by said housing to be rotatable about an axis which is substantially parallel to the rotational axis of said chuck;

drive means for swinging said swing arm between a workpiece pick-up position and a workpiece delivery position;

workpiece support means supported on said swing arm to be rotatable about an axis which is perpendicular to the axis of swinging movement of said swing arm for supporting a disk-like workpiece thereon, and being held within a substantially horizontal plane when said swing arm is at its pick-up position; and

rotary means operated by said drive means for rotating said workpiece support means a predetermined angle during a part of the swinging movement of said swing arm so as to align the workpiece held on said support means with said chuck when said swing arm is swung into its delivery position.

4,204,442

CUTTER HOLDING DEVICE IN A POLYGON CUTTING APPARATUS

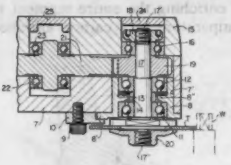
Takayuki Nomura, Tanazawa 437, Okutamamachi, Nishitamagun, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,188

Int. Cl.[2] B23B *3/28*

U.S. Cl. 82—18 **2 Claims**

1. A cutter holding device in a polygon cutting apparatus, which is embodied into a spindle movable type automatic lathe, the cutter holding device being characterized in that a shaft with a rotary cutter held thereon is rotatably supported on two angular contact ball bearings mounted on a sleeve removably secured to a first housing and further supported on a third bearing mounted on a second housing, said two angular contact ball bearings being applied with a prepressure or preload by a belleville spring, and a driving gear is fastened to said shaft by a fastening force of a nut meshed with a threaded portion formed on one end of said shaft.



4,204,443

CUTTING METHOD AND APPARATUS

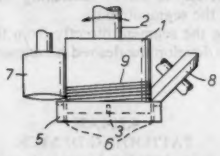
Albert McLuskie, 6 Newland Ave., Harrogate, North Yorkshire, England

Filed Feb. 23, 1978, Ser. No. 880,369

Claims priority, application United Kingdom, Mar. 4, 1977, 9191/77; Mar. 4, 1977, 9199/77

Int. Cl.[2] D06H *7/00*

U.S. Cl. 83—37 **17 Claims**



1. A method of cutting continuous lengths of material into shorter lengths comprising winding the material in turns about a cylindrical surface of a drum and while substantially preventing the turns from overriding one another positively forwarding the wound material in an axial direction along the drum to impinge against cutting blades projecting radially therefrom and spaced around the drum periphery, said blades having radially extending cutting edges.

4,204,444

BAND SAW GUARD DEVICE

John M. Kohr, 598 Western Ave., Magnolia, Mass. 01930

Filed Feb. 1, 1979, Ser. No. 8,380

Int. Cl.[2] B26D *7/22*

U.S. Cl. 83—56 **8 Claims**

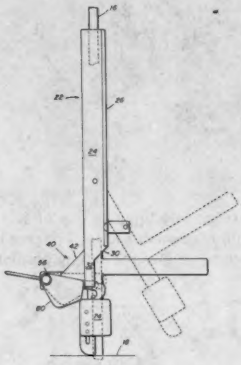
1. In a machine having a band saw rotating adjacent to a movable table, the table adapted to carry blocks to be cut by the band saw the machine including a protective guard about the band saw, the band saw normally being exposed in a cutting zone, the zone comprising at least the distance from the movable table carrying the block to a location above the block being cut the improvement which comprises:

a device secured to the machine and adjacent the band saw, the device disposed in the cutting zone and adapted to shield the blade from contact except when a block to be cut is moved therethrough, the device comprising;

a fixed member secured to the machine adjacent the band saw, said fixed member having an upper end and a lower end, a counterbalanced locking assembly rotatably pinned to the lower end of the fixed member the locking assembly having a lower camming surface adapted to engage the block being cut;

a movable member secured to the fixed member and adapted

for rotatable movement from a closed position adjacent the band saw to an open position, said movable member having an upper end and a lower end, means at the lower end of the movable member to engage the locking assembly of the fixed member, and means to maintain the mov-



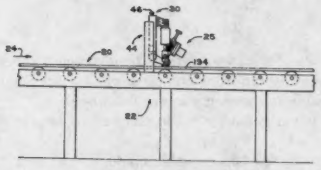
able member biased to a locked position whereby when the block engages the cammed surface the locking assembly disengages from the movable member and the movement of the block rotates the movable member from its closed position to an open position.

4,204,445

SCORING DEVICE HAVING A REFERENCING CARRIAGE

John A. Goldinger, Boiling Springs, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 801,712, May 31, 1977, Pat. No. 4,137,803. This application Sep. 26, 1978, Ser. No. 945,934
Int. Cl.² B26D *3/08*
U.S. Cl. 83—880 **6 Claims**



1. A method of scoring a sheet of refractory material, comprising the steps of:

advancing the sheet along a predetermined path under force adjusting means and scoring means;

biasing the force adjusting means under a first predetermined force in a predetermined direction to bias the scoring means against the sheet under a second predetermined force to score the sheet; while

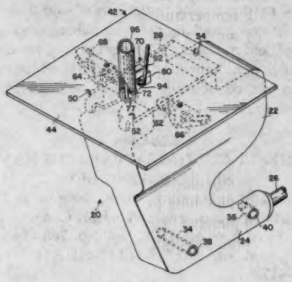
pivoting the force adjusting means and scoring means about a common axis as the sheet moves thereunder to maintain a substantially constant biasing force on the scoring means as the sheet displaces or permits displacement of the scoring means and load adjusting means toward and away from the predetermined path.

4,204,446

WORK TABLE AND HOLD-DOWN ASSEMBLY FOR POWER HAND SAW

E. Stanley Knochel, 4202 Glenmore Ave., Baltimore, Md. 21206

Filed Nov. 6, 1978, Ser. No. 958,201
Int. Cl.² B27B *19/00*
U.S. Cl. 83—146 **8 Claims**



1. In combination with a power hand saw having a housing, a reciprocating saw blade mounted in the housing and a base supported by the housing, a work table and hold-down assembly for adapting the saw for bench use, said assembly including

(a) a work table having an opening therein through which said saw blade passes,

(b) a first means for securing said work table to the hand saw base,

(c) a work hold-down member, and

(d) a second means engaged with said work hold-down member and said work table for holding the former in spaced relation to the latter,

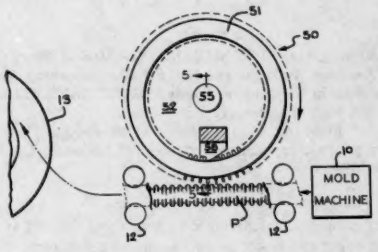
(e) said second means being swivelly mounted on said work table in surrounding relation to the saw blade, whereby said second means and said hold-down member engaged therewith may be swivelled around the saw blade to move the same out of the path of the work during the sawing operation.

4,204,447

APPARATUS FOR PERFORATING CORRUGATED PLASTIC PIPE

David W. Slaughterbeck, Rte. #7, Findlay, Ohio 45840

Filed Dec. 16, 1977, Ser. No. 861,424
Int. Cl.² B26F *1/08, 3/08*
U.S. Cl. 83—171 **13 Claims**



1. An apparatus for perforating the wall of an elongated tubular drain pipe of thermoplastic material having a predetermined melting temperature, said apparatus comprising, in combination, a plurality of spaced apart elongated punches having punching ends, means mounting each of said punches to reciprocate along an axis between a retracted position and an extended position, means for heating said punching ends to a

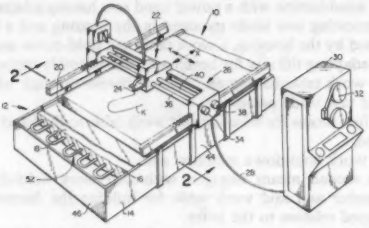
temperature substantially equal to but slightly below the predetermined melting temperature of such thermoplastic material, means for axially moving said drain pipe from a remote position to a punching position opposite the punching ends of said punches, and means for reciprocally moving said punches from said retracted position to said extended position, said reciprocal movement being along the axis of each of said punches with that axis being coincident with radial reference axes extending substantially perpendicular to the axis of said drain pipe when said pipe is in said punching position, whereby said reciprocal movement of said punches causes said heated punch to slightly soften and then punch through the wall of said drain pipe when moved from said retracted position to said extended position.

4,204,448

FLUID JET CUTTING APPARATUS HAVING SELF-HEALING BED

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Nov. 13, 1978, Ser. No. 960,116
Int. Cl.[2] B26F 3/00; D06H 7/00
U.S. Cl. 83—177 **14 Claims**



1. Fluid jet cutting apparatus comprising a material supporting bed including a tank having an open top, a substance contained in said tank and having an exposed upper surface, said subtance having a liquid state and a solid state, said upper surface in its solid state constituting a material supporting surface, and means contained within said tank for altering the physical state of said substance and maintaining in said solid state at least the portion of said substance defining said upper surface, a jet cutting tool having a nozzle for discharging a jet of cutting fluid, means supporting said cutting tool with said nozzle disposed above said upper surface to discharge said cutting fluid toward said upper surface, and means for moving said supporting means relative to said upper surface.

4,204,449

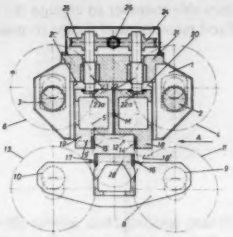
FLYING CROPPING SHEARS FOR HOT STRIP

Emil F. Kersting, Ratingen, and Rolf Schulte, Düsseldorf, both of Fed. Rep. of Germany, assignors to SACK GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,968
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645398
Int. Cl.[2] B26D 1/56
U.S. Cl. 83—328 **6 Claims**

1. In a parallel crank flying cropping shear for hot strip including upper and lower parallel connecting members, each of said connecting members including means synchronizing one connecting member with the other connecting member for synchronous counter-rotation of the connecting members, said parallel crank cropping shear further including the improvement comprising:

two pairs of cutters, one of each pair being mounted on the upper connecting member and the other of each pair being mounted on the lower connecting member, said synchronizing means including means for maintaining parallelism of said upper and lower cutters in a pair; and



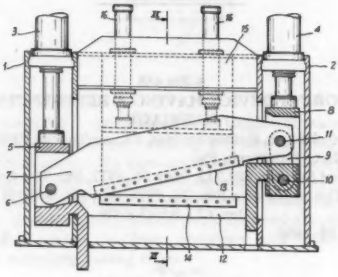
means for selectively bringing one of said pairs of cutters into a cutting position and for bringing the other of said pairs of cutters out of the cutting position.

4,204,450

SHEAR FOR LARGE-SIZED SCRAP

Emile Le Guelennec, Pont-Scorff, France, assignor to Machines et Applications, France

Filed Jun. 21, 1978, Ser. No. 918,294
Claims priority, application France, Sep. 9, 1977, 77 27319
Int. Cl.[2] B26D 5/12
U.S. Cl. 83—461 **1 Claim**



1. A shear for cutting large-size plates and sheets of non-homogeneous scrap-irons comprising:

(a) a frame supporting a lower fixed blade,

(b) an upper movable blade adapted to engage said fixed blade.

(c) a carrier for said movable blade,

(d) a pair of vertical hydraulic-actuated cylinders, each having its movable portion guided for reciprocal vertical strokes,

(e) a transverse pivot pin connecting the movable portion of one vertical hydraulic-actuated cylinder of said pair to one lateral end of the carrier of the movable blade,

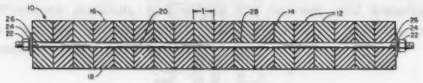
(f) a link having its lower end pivotally connected to the movable portion of the other vertical hydraulic-actuated cylinder of said pair and having its upper end pivotally connected to the other lateral end of said carrier of the upper movable blade, so that said link applies a traction force on the carrier of said movable blade when a lowering force is applied to the movable portion of the vertical hydraulic-actuated cylinder connected thereto,

(g) and upper presser cylinders adapted to hold the piece to be cut in position on said fixed blade.

4,204,451
CUTTING BLOCK EMPLOYING CUTTABLE RODS

Leonard K. Reichert, 16 Euston St., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 861,631, Dec. 19, 1977, Pat. No. 4,143,753. This application Feb. 24, 1978, Ser. No. 881,049
The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.
Int. Cl.[2] B26D *7/20*
U.S. Cl. 83—658 13 Claims



1. A cutting block comprising a plurality of planar members, each member having a thickness between planes small compared to its length,

said planar members being assembled to form an integral laminated structure,

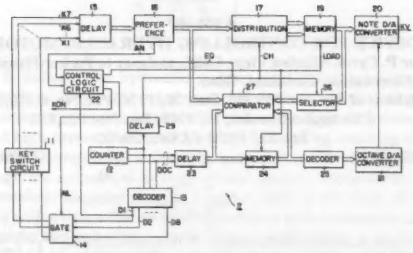
said laminated structure having substantially planar, broad opposing surfaces, and

at least one nonmetallic rod member extending within said laminated structure, each rod member passing through at least two of said members, and each of said rod member being comprised of a material having a resistance to cutting below a predetermined die damage level.

4,204,452
SINGLE KEY PREFERENTIAL SELECTION DEVICE IN ELECTRONIC MUSICAL INSTRUMENT

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jun. 2, 1978, Ser. No. 911,710
Claims priority, application Japan, Jun. 8, 1977, 52-67593
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 3 Claims



1. A single key preferential selection device in an electronic musical instrument comprising:

(a) a key switch circuit having input terminals, output terminals and a number of key switches connected between said input terminals and said output terminals in a matrix fashion, the input terminals defining a plurality of key switch groups, and the output terminals for delivering key detection signals in parallel via closed ones of said key switches;

(b) a scanning signal generating circuit for sequentially and repetitively applying scanning signals to said plurality of input terminals in a predetermined order, the repetition taking place at a period of scanning sequence, whereby said key detection signals are delivered when the scanning signal is being applied to the output terminal to which any closed key switches are connected;

(c) a preference circuit for selectively delivering out a single key detection signal of the highest priority from among key detection signals according to a predetermined priority order upon receipt of said key detection signals;

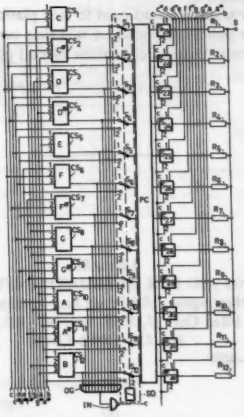
(d) a control circuit which, when said key detection signal is delivered from said preference circuit first time in each said period, inhibits the application of said scanning signals during a period from the delivery of said key detection signal to the end of each said period of scanning sequence; and

(e) circuit means connected to said scanning signal generating circuit and to said control circuit for producing a group indication signal indicating the group at which said single key detection signal is delivered.

4,204,453
DEVICE FOR AUTOMATIC TONAL ACCOMPANIMENT IN ELECTRONIC MUSICAL INSTRUMENTS

Ulrich Gross, Geldrop, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,006
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659291
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 8 Claims



1. A device for automatic tonal accompaniment in electronic musical instruments equipped with a rhythm unit, the fundamental, the quint or another tone related to specific chords being held and/or the chord itself becoming available in a predetermined sequence in the selected rhythm, said device comprising chord sensor means responsive to at least one tonal key for producing at its output a first control signal in the presence of a chord, and switching means independent of the rhythm unit coupled to the associated chord sensor means for producing a second control signal identifying individual tones in the absence of a chord.

4,204,454
INSTRUCTIONAL APPARATUS FOR STRINGED INSTRUMENT

Clare F. Severn, 11400 Liberty St., Clio, Mich. 48420

Filed Sep. 20, 1978, Ser. No. 943,785
Int. Cl.[2] G09B *15/06;* G10D *3/00*
U.S. Cl. 84—315 6 Claims

1. An apparatus to aid the beginning student in learning the correct finger positions required for producing basic chords on the neck of a stringed instrument comprising:

a flat platform having a plurality of throughbores aligned in rows so that each throughbore in a row registers with a string across the neck of the instrument when the platform

is placed over the neck, each row being aligned along the neck to register with predetermined nodal points along the strings of the instrument;

means for mounting said platform to said instrument in position spaced above said neck,

a plurality of plungers, each adapted to be received through one of said throughbores so that depression of said

plunger engages and depresses the string registering with that one of said throughbores into contact with the neck;

a card having a face surface and a plurality of slots therethrough which are adapted to register with said rows of throughbores;

means for clamping said card to said platform; and

instrucion indicia provided on said face surface of said card to indicate desired depressions of said plungers.

4,204,455

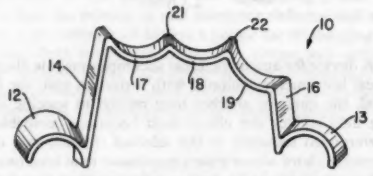
PLAYING AID FOR KEYBOARD INSTRUMENTS

William O. Harrington, 15 Walnut La., Manhasset, N.Y. 11030

Filed Oct. 27, 1978, Ser. No. 955,310

Int. Cl.[2] G09B *15/06*

U.S. Cl. 84—468 **6 Claims**



1. A playing aid to be mounted on the hand for positioning the thumb and fingers to a predetermined posture for playing selected pitch intervals on a keyboard instrument, the playing aid comprising:

a pair of grips to engage the thumb and fourth finger, respectively, and being rigidly spaced apart so as to posture the thumb and fourth finger for depression thereby of keys on the keyboard corresponding to a selected interval of musical pitches, each of said grips having a portion overlying the upper surface of its corresponding thumb and finger and being interconnected by a raised bridging portion defining a surface between the thumb and fourth finger for engaging the undersurface of each of the remaining fingers of the hand to elevate said remaining fingers above the plane of said grips to posture them away from the keyboard.

4,204,456

PNEUMATIC EJECTOR FOR BOMB

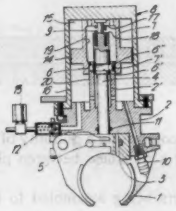
Frederick D. Ward, St-Foy, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Oct. 2, 1978, Ser. No. 947,525

Claims priority, application Canada, Nov. 16, 1977, 290983

Int. Cl.[2] B64D *1/04*; F41F *5/02*

U.S. Cl. 89—1.5 G **7 Claims**



1. A mechanism for use in an ejector system comprising:

(a) a housing;

(b) piston means mounted for longitudinal movement in said housing and dividing the same into two chambers having a gas leakage space therebetween:

(c) means to inject a pressurized gas into said chambers;

(d) means to exhaust said gas from one of said chambers at a rate in excess of the rate of gas leakage between said chambers, to thereby effect longitudinal movement of said piston means through said one chamber;

(e) actuator means in said housing for movement between a first position within said housing and a second position extending therefrom in response to an operative pressure applied thereto by said piston means during said longitudinal movement thereof; and,

(f) lock means to releasably secure said actuator means in said first position in association with said piston means which is adjacent one end of said housing.

4,204,457

DEVICE FOR CONTROLLING HYDRAULIC MOTORS

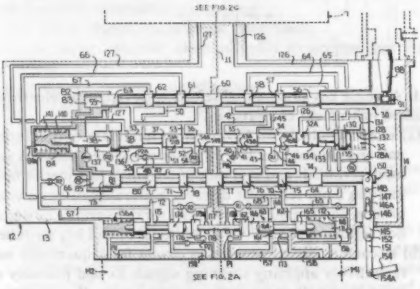
Luc P. Cyrot, Mission Viejo, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 755,935, Dec. 30, 1976, Pat. No. 4,138,088.

This application Jul. 10, 1978, Ser. No. 922,914

Int. Cl.[2] F15B *13/043, 20/00*

U.S. Cl. 91—31 **13 Claims**



1. A device for controlling flow of fluid to and from a fluid motor, said device having a first conduit for supplying fluid under pressure, first and second master valves each positionable for directing fluid to and from said motor, a hydraulically operated command shaft connected to said first master valve

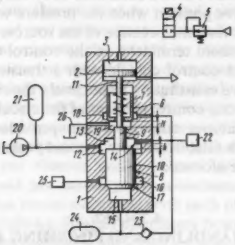
for positioning the same, mechanical means for positioning said second valve, a transfer valve movable between a first position in which it connects said first conduit with said first master valve and a second position in which it connects said first conduit to the second master valve, said transfer valve having a first fluid pressure responsive surface exposed to fluid in a second conduit for moving said transfer valve to said first position, said transfer valve having an intermediate position between said first and second positions, means for providing restricted flow of fluid through said transfer valve in said intermediate position, and means for moving said transfer valve to said second position when there is no fluid under pressure in said second conduit.

4,204,458

PULSATOR FOR HYDRAULIC SYSTEMS CONTROLLING ACTUATING MECHANISMS

Ivan V. Kononov, ulitsa Torpedo, 40, kv. 4; Mikhail P. Makushin, ulitsa Volgo-Donskaya, 16, kv. 41; Ivan E. Maslennikov, ulitsa Lizjukova, 43, kv. 57; Vladimir N. Platonov, ulitsa Lizjukova, 43, kv. 112, and Igor I. Silantiev, ulitsa Voroshilova, 44, kv. 98, all of Voronezh, U.S.S.R.

Filed Oct. 25, 1978, Ser. No. 954,572
Int. Cl.² F15B *21/12*
U.S. Cl. 91—429 **1 Claim**



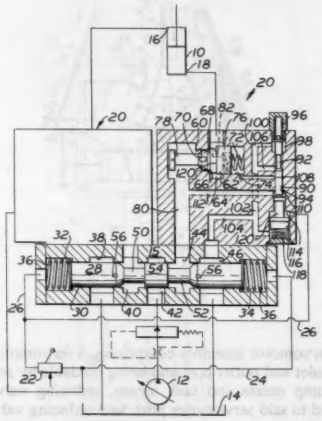
1. A pulsator for hydraulic systems controlling actuating mechanisms, connected via a non-return valve to an actuating mechanism, communicating with a pneumatic control system, with a high-pressure main, with a valve controlling resetting of a pusher, comprising a housing provided with cylindrical borings, the cylindrical borings of said housing accommodating coaxially disposed therein: a pusher made in the form of a piston with a rod; a delivery valve mounted with a clearance in respect to said rod of said pusher; a pneumatic piston; a cavity connected to a pneumatic control system; said pneumatic piston displacing in said cavity; an upper cavity of the pusher piston, disposed above said piston of said pusher and communicating with the high-pressure main; a lower cavity of the pusher piston, disposed under said piston of said pusher and communicating via a non-return valve with said actuating mechanism; a stem mechanically connected by its opposite ends respectively to said pneumatic piston and to the butt end of said rod of said pusher; said stem passing through a port made in said delivery valve; an auxiliary cavity connected to said actuating mechanism, being an extension of said upper cavity and defined by a leading edge serving for separating said cavities when it touches said piston of said pusher at the moment of its upwardly movement for opening said delivery valve; an annular cavity disposed coaxially above said lower cavity, separated from said lower cavity of said piston by a leading edge interacting with said pusher piston, and connected to the valve controlling resetting of said pusher.

4,204,459

COMBINATION CHECK AND FLOW CONTROL VALVE FOR HYDRAULIC SYSTEMS

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1978, Ser. No. 897,895
Int. Cl.² F15B *11/08, 13/042*
U.S. Cl. 91—445 **8 Claims**



1. A hydraulic system comprising:
a hydraulic pump;
a hydraulic motor having at least one port;
a hydraulic reservoir;
a main spool valve interposed between said motor and said pump and reservoir and having a spool shiftable between positions (a) connecting said pump to said port, (b) connecting said reservoir to said port, and (c) blocking fluid flow to or from said port;
a single, combination check and flow control valve interposed between said main spool valve and said port and having a valve seat, a valve member seatable thereagainst, a spring biasing said valve member towards said seat, a pressure responsive surface adapted to act in contact with said spring, said pressure responsive surface being open to the pressure in said motor, and flow metering means for metering fluid flow through said combination valve when said valve member is close to said seat, said valve member being movable between (a) a position closed against said seat, (b) a variety of positions close to said seat for metering fluid flow, and (c) a position remote from said seat for allowing relatively free fluid flow;
sensing means for sensing a pressure differential across said main spool valve, said sensing means being acted upon by pressure between said main spool valve and said combination check and flow control valve and by pressure in a line leading to reservoir; and
means responsive to said sensing means for relieving the pressure at said pressure responsive surface.

4,204,460

ARRANGEMENT FOR INFLUENCING THE OPERATING QUANTITY OF A SERVO-MOTOR

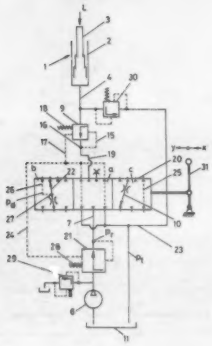
Hans S. Andersen, Augustenborg, and Preben Christiansen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 758,613, Jan. 12, 1977, abandoned. This application Mar. 3, 1978, Ser. No. 883,287

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2601999

Int. Cl.² F15B 11/08, 13/042

U.S. Cl. 91—447 1 Claim



1. A servomotor assembly comprising, a servomotor having a single inlet and outlet port and being loadable by an external force, pump means and tank means, reducing valve means connected to said servomotor port, said reducing valve means having pressure responsive setting means and desired valve spring means biasing said reducing valve means in an opening direction, said reducing valve means having first and second pressure chambers with pressure therein respectively opposing and assisting said spring means relative to said setting means, a pressure regulating valve connected to said pump means and having second desired valve spring means biasing said pressure regulating valve in a closing direction, said pressure regulating valve having first and second pressure responsive portions with pressures acting thereon respectively opposing and assisting said second desired valve spring means, switching valve means between said reducing valve means on the one hand and said pressure regulating valve and said tank on the other hand, said switching valve means having first and second throttles, said switching valve means being operable to retract said load by placing said first throttle in series with said reducing valve means and connecting said reducing valve second chamber to said tank, said switching valve means being alternately operable to advance said load by placing said second throttle in series with said reducing valve means and said pressure regulating valve and connecting said second chambers of both said reducing valve means and said pressure regulating valve to the output of said second throttle valve, said reducing valve first chamber being connected to a circuit point between said reducing valve means and said switching valve means for both operable states of said switching valve means.

4,204,461

HYDRAULIC CONTROL SYSTEM FOR ELECTRIC CIRCUIT-BREAKERS

Claude A. Gratzmuller, 97 Avenue Victor Hugo, 75016 Paris, France

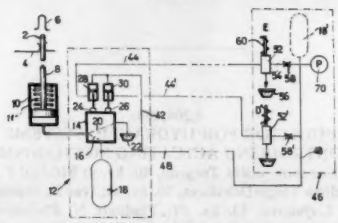
Filed Jan. 2, 1979, Ser. No. 632

Claims priority, application France, Jan. 4, 1978, 78 00106

Int. Cl.² F15B 13/043, 1/02

U.S. Cl. 91—454 12 Claims

1. A hydraulic control system for a ciruit-breaker or circuit-breaker module which can be remotely actuated from a control cubicle, said system being of the known type comprising a pressure source, a low-pressure container, a device for continuously restoring the circuit-breaker to the open position by elastic action, a hydraulic jack for closing the circuit-breaker in opposition to said elastic means and maintaining the breaker in the closed position when supplied under pressure, a control unit in the immediate proximity of said jack and comprising on the one hand at least one valve for supplying and draining the jack and on the other hand two pilot valves designated as a closure valve and a trip valve and each having a rest position and an active position in which said valves are transiently actuated, said supply and drain valves being switched by said two pilot valves respectively to the supply positions and to the



drain position, wherein each pilot valve aforesaid is controlled by a hydraulic device having on the one hand a first input connected to said pressure source and on the other hand a second input connected to a control line for bringing said pilot valve to the active position when the pressure within the control line is lower than the pressure of the source, wherein each control line aforesaid terminates in the control cubicle and is fitted within said control cubicle with a transiently operable drain electrovalve constituting respectively the closure control element and the trip control element of the circuit-breaker and wherein a continuous communication provided with flow-limiting devices is established between said pressure source and each control line aforesaid.

4,204,462

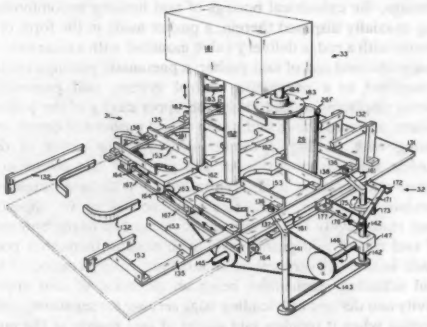
CONTAINER HANDLING AND FINISHING APPARATUS

Frank P. Richards, Prairie Village, Kans., and Raymond C. Taylor, Grandview, Mo., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 630,555, Nov. 10, 1975, Pat. No. 4,072,226. This application Nov. 21, 1977, Ser. No. 853,651

Int. Cl.² B31B 1/74

U.S. Cl. 93—36.5 R 16 Claims



1. Container finishing apparatus comprising:

at least one receiving station for receiving a supply of open-topped containers;

conveyor means associated with each said receiving station for

incrementally advancing each container received at said associated receiving station in a generally straight path along a container line to at least one subsequent container finishing station;

container finishing means located at at least one of said subsequent container finishing stations for performing a finishing operation on a container located at said one of said subsequent container finishing stations so as to provide a finished container;

gripping means operatively related to each said conveyor means for grasping a container at said one of said subsequent container finishing stations and substantially eliminating movement of said thus grasped container at said one of said subsequent container finishing stations, each said gripping means comprising:

two generally parallel gripping members located respectively at each side of said respective container line, each said gripping member being adapted to mate with the other said gripping member on the opposite side of said respective container line to define jaw means for grasping a container at said one of said subsequent container finishing stations and substantially eliminating movement of said thus grasped container at said one of said subsequent container finishing stations;

first means operatively related to each said gripping member located at a first side of each container line for moving each gripping member operatively related thereto between a first withdrawn position whereby containers can be moved by said conveyor means operatively related thereto along the generally straight path of the container line adjacent thereto and a second gripping position whereby said jaw means grasps a container; and

second means operatively related to each said gripping member located at a second side of each container line for moving each gripping member operatively related thereto between a first withdrawn position whereby containers can be moved by said conveyor means operatively related thereto along the generally straight path of the container line adjacent thereto and a second gripping position whereby said jaw means grasps a container; and

discharge station means associated with each of said conveyor means for receiving finished containers from said conveyor means and appropriately disposing of said containers thus received.

4,204,463

STACK DESIGN

Jack Carty, 2 Model Ct., Rocky Point, N.Y. 11778

Filed Jul. 18, 1978, Ser. No. 925,835
Int. Cl.[2] F23L *17/02*
U.S. Cl. 98—58 **5 Claims**

1. A chimney stack conveying hot gases comprising the following:

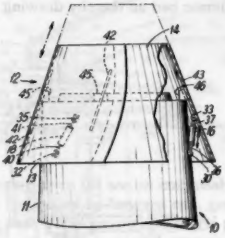
(a) An outer conical structural column member having a base portion and an upper portion wherein means are provided for introducing into said conical structural column member emitted gases that are to be conveyed into the atmosphere by said chimney stack;

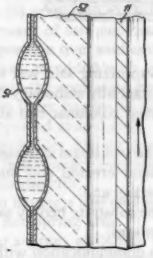
(b) A multi-leaf truncated cone member affixed to the upper portion of said outer conical structural column member wherein said multi-leaf truncated cone member having its configuration selectively altered so as to cause the opening at the top of said multi-leaf truncated cone member to adjust in size, wherein said multi-leaf truncated cone member comprises:

(i) A plurality of leaf members, curved and positioned in an overlapping configuration with each other so as to define a truncated cone, said leaf members having the edges of their respective overlapping surfaces slide across one another such that the truncated cone defined by said configuration being selectively altered as to its overall dimensions such that the diameter of the top opening of said truncated cone configuration can be selectively modified;

(ii) Means for selectively moving in unison each of said leaf members such that the respective overlapping surfaces of said leaf members slide across one another so as to selectively modify the multi-leaf truncated cone configuration;

(iii) Structural means for affixing said multi-leaf truncated cone member to the top of said outer conical structural





column member so as to permit the selective movement of each of said leaf members;

(c) Damping means structurally affixed at the base portion of said outer conical structural column member so as to provide a means for absorbing energy from the said outer conical structural column member; and

(d) Means for extracting thermal energy from the hot gaseous medium passing through the interior of said outer conical structural column member for utilization as a source of energy exterior to said chimney stack.

4,204,464

CONTINUOUS DESORPTION APPARATUS FOR AROMA FLAVOR CONCENTRATE

Rudolf G. K. Strobel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 846,000, Oct. 27, 1977, abandoned. This application Mar. 9, 1979, Ser. No. 18,975
Int. Cl.[2] A47J *31/30, 31/42*
U.S. Cl. 99—286 **5 Claims**

1. In a desorption apparatus for separating flavor and aroma products from an aroma- and flavor-bearing substrate, wherein the improvement comprises:

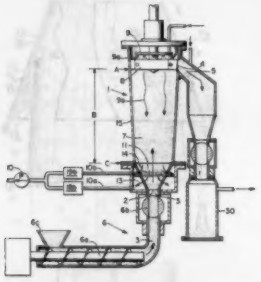
(a) an upright desorption column having a bottom inlet port for continuously receiving chilled fresh substrate and a top outlet port for discharging desorbed substrate;

(b) a feeding means connected to said bottom inlet port for force-feeding said fresh substrate at a predetermined rate upwardly through said upright desorption column via said ports and thereby forming a continuously flowing columnar bed of said substrate, and a means for discharging said

desorbed substrate at a predetermined rate through said top outlet port;

(c) wet steam means for applying a predetermined quanitity of wet steam, from the top of said column, downwardly and counter-currently to and through said flowing bed, making contact with said substrate and thereby de-aromatizing and desorbing flavors from said substrate;

(d) a vacuum means for holding said desorption column under vacuum, said vacuum means being in communication with said column above said bottom inlet port, said vacuum means creating a traverse force in said upwardly flowing columnar bed an thereby drawing down the wet



steam and further vaporizing said wet steam in said column, wherein a substantially stationary desorption zone is formed in said flowing columnar bed above said bottom inlet port by:

(1) precipitation of the wet steam as it passes into a cooling temperature gradient created and maintained by said fresh chilled substrate; and

(2) compaction of the substrate bed by said traverse force and said feeding means;

(e) cold trap means, in communication with said desorption zone and said vacuum means for separating and collecting:

(1) a vaporous aroma flavor bearing fraction, and

(2) a liquid soluble-solids fraction.

4,204,465

STEAM AND HOT LIQUID DISPENSING DEVICE

Helmut Knecht, Clark, N.J., assignor to Adams Industries, Inc., Union, N.J.

Filed Nov. 17, 1978, Ser. No. 961,612

Int. Cl.[2] A47J 31/54

U.S. Cl. 99—293 **16 Claims**

1. A steam and hot water dispensing device comprising;

a sealable container for holding liquid and steam under pressure;

heating means to heat said sealable container;

a common tube for liquid and steam disposed at least partially within said sealable container;

liquid inlet means communicating with said common tube,

liquid outlet means communicating with said common tube and extending from said sealable container to carry liquid discharged from said sealable container;

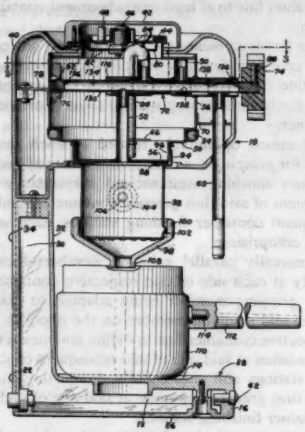
steam inlet means communicating with said common tube;

steam outlet means communicating with said common tube and extending from said sealable container to carry steam discharged from said sealable container;

a transfer tube disposed at least partially within said common tube;

passage means in said transfer tube to selectively and alternatively communicate said common tube steam inlet means with said steam outlet means and said liquid inlet means and said liquid outlet means; and

positioning means to selectively position said transfer tube so that said transfer tube passage means will selectively communicate said liquid inlet means with said liquid outlet



means and said steam inlet means with said steam outlet means.

4,204,466

PLANT FOR THE AUTOMATIC PRODUCTION OF ARABIC FLAT BREAD

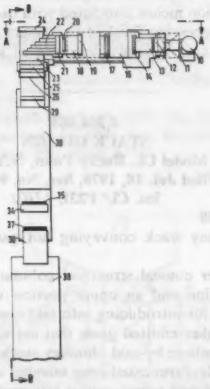
Walter Schnee, Villingen, Fed. Rep. of Germany, assignor to Fr. Winkler KG, Villingen, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,296

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752464

Int. Cl.[2] A21B 7/00

U.S. Cl. 99—443 C **21 Claims**



1. A plant for the automatic production of Arabic flat bread, comprising a dough portioning machine, a kneading arrangement for forming ball-like dough pieces, a prefermentation housing, at least a rolling device for making substantially flat dough pieces, a final fermentation housing comprising carriers for supporting said dough pieces, and a baking oven, characterized in that the carriers are fermentation trays having an even surface and a continuous border, said fermentation trays being filled to the brim with bran and being suspended to freely swing in two directions from endless conveyor means that move through said fermentation housing in a serpentine path, and further comprising transfer belt means and guide means,

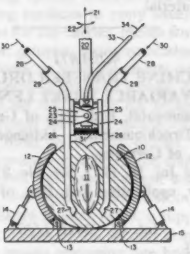
said transfer belt means comprising a substantially tongue-shaped tip for reaching under the dough pieces lying on said bran in said fermentation trays, said fermentation trays being tilted toward said tongue-shaped tip at least in part by said guide means.

4,204,467

DE-STONING AND SIMULTANEOUSLY FILLING A DRUPE

Lester G. Peters, Box 407, Newburyport, Mass. 01950

Filed Aug. 4, 1978, Ser. No. 931,136
Int. Cl.[2] A23N 4/12; A47J 25/00
U.S. Cl. 99—494 **2 Claims**



1. A device adapted to remove the stone of a drupe while simultaneously injecting a filling into the stone cavity, comprising:

(a) a claw member comprising a shaft and at least three prongs pivotedly mounted to an end of said shaft, said prongs having an open position and a closed position;

(b) said prongs being shaped for the penetration of said drupe and being positioned in the open position to fit about the stone of said drupe and in the closed position to grip said stone for extraction;

(c) at least one of said prongs having a passageway permitting the passage of a flowable filling therethrough, one end of said passageway opening near the end of said one prong that enters into said cavity to the bottom portion thereof when said prongs are in a position to effect extraction of said stone, and the other end of said passageway being adapted to receive a pressurized supply of said flowable filling;

(d) means for positioning said drupe adjacent said claw member with said stone oriented for gripping by said prongs;

(e) means for effecting a linear reciprocating motion of said claw member to and from said drupe with entry of said prongs into said drupe about the stone thereof on the stroke to said drupe and extraction of said stone on the stroke from said drupe;

(f) means for effecting pivotal movement of said prongs from said open to said closed position during extraction of said stone and back to said open position when said prongs are removed from said drupe;

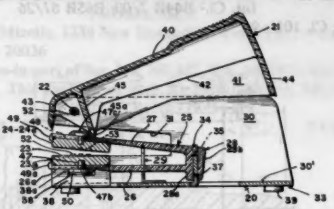
(g) means for injecting a pre-determined amount of said filling through said one prong during the extraction of said stone.

4,204,468

EMBOSSING PRESS

Paul H. Harrison, Santa Barbara, Calif., assignor to M & R Seal Press Co., Inc., Roselle, N.J.

Continuation of Ser. No. 747,056, Dec. 3, 1976, abandoned, which is a continuation of Ser. No. 524,324, Nov. 15, 1974, abandoned. This application Jul. 20, 1978, Ser. No. 926,340
Int. Cl.[2] A44B 5/00
U.S. Cl. 101—3 SP **23 Claims**



1. An embossing press for use on embossable sheet material and having an embossing or forward end, comprising

(a) a unitary base frame having as integral parts thereof (i) a floor having integral front and rear portions, said front portion including

(b) means for supporting a die-holder thereon at said embossing end and, (ii) upwardly extending from said floor at a position rearward of said embossing end and thence forwardly to a position over said embossing end a lever-supporting portion, provided with means for pivotally supporting thereon the anchoring end of an operating lever;

(c) an operating lever having an anchoring end and being pivotally supported at said end,

(d) a lower die-holder having a support back supported thereon and in stationary position on said die-holder supporting means therefor,

(e) a spring arm having a free end near said forward end and a fixed end, said spring arm

(i) serving to support at its free end an upper die-holder also having a support back and spaced above said lower die-holder and in a position to enable said upper die-holder to be moved with that free end toward and away from said lower die-holder, whereby by such movement of the upper die-holder toward said lower die-holder their respective opposed faces are brought into mating registry during embossing operation, and

(ii) having anchoring means as an unitarily integral part thereof at the fixed end;

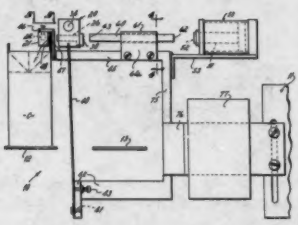
(f) said frame floor having as a unitarily integral part thereof and extending directly upwardly therefrom a spring arm-anchoring means holding part, to which holding part there is fixedly yet removably anchored said spring arm-anchoring means;

(g) said spring-arm anchoring means being so designed as to friction-fittingly fixedly yet removably anchor the spring arm to said anchoring means holding part; and

(h) said operating lever having a pressure-transmitting member depending therefrom at said embossing end and rearward of said pivotal support means, said member being so positioned to be brought into pressure-transmitting contact with the top surface of said upper die-holder, whereby manual downward force applied to the top surface of said operating lever at a locus behind said member will cause said lever to pivot on said pivotal support means impelling said upper die-holder to move downwardly toward said lower die-holder thereby effecting mating engagement between their opposed faces for embossing sheet material placed between said faces; said spring arm being flat and bifurcated at its free end and thus being provided with adjacent spaced apart spring fingers bounding an open-ended longitudinal slot as means for supporting said upper die-holder, said upper die-holder having on its top securing means enabling the die-holder

to be fixedly but removably engaged by the bifurcated end of the spring arm.

4,204,469
CARTON BRANDER
John A. Johnson, Rte. 1, Box 614-C, New Richmond, Ohio 45157
Filed Jun. 26, 1978, Ser. No. 918,926
Int. Cl.[2] B44B *7/00*; B65B *61/26*
U.S. Cl. 101—9 **28 Claims**



1. In brander apparatus comprising a heated dater block means and anvil means, one of which is movably mounted with respect to the other, actuating means for moving one of said dater block means and said anvil means toward the other to brand a carton flap therebetween, said actuating means comprising:

a cylinder having a selectively extensible piston,

a slidably mounted rod extending between said cylinder and one of said dater block means and said anvil means,

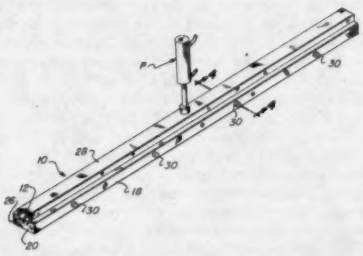
said piston and said rod having respective axes in operative alignment with each other,

said rod having a forward end and a rearward end, said forward end located proximate to but spaced from one of said dater block means and said anvil means, and said rearward end disposed proximate but spaced from said piston,

said piston, when extended, engaging said rod at said rearward end, and

said rod at said forward end engaging one of said dater block means and said anvil means for moving it toward the other when said piston is extended and for engaging it with a carton flap.

4,204,470
INDICIA FORMING MULTIPLE DIE
James W. Craighead, 501 Dexter St., Denver, Colo. 80220
Filed Aug. 31, 1978, Ser. No. 938,392
Int. Cl.[2] B44B *5/02*
U.S. Cl. 101—28 **10 Claims**



1. A device for receiving a pressurizing tool and forming decorative indicia on malleable material, which is positioned between said device and the pressurizing tool, said device comprising;

a first die having transverse openings and a surface with a first preselected pattern for forming a portion of the decorative indicia on the malleable material;

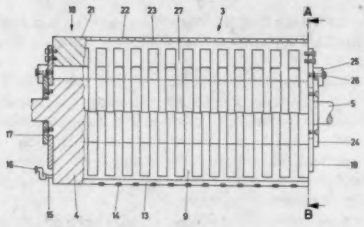
a recess within a portion of said surface for receiving a second die;

a second die receivable within said recess of said first die and having a surface with a second preselected pattern completely contained within said recess, wherein said second pattern lies in substantially the same plane as said first pattern to simultaneously deform the malleable material and form decorative indicia thereon upon application of the pressurized tool;

a slot formed in said first die only, said slot being generally perpendicular to said transverse openings while being vertically adjacent said recess to provide resilience to said first die and facilitate the insertion and releasing of said second die within said recess; and

fastening means positioned in said transverse openings and said slot to hold said second die in said first die and position said second preselected pattern adjacent said first preselected pattern to minimize decorative flaws in the deformed material.

4,204,471
PRINTING MACHINE TRANSFER DRUM ADJUSTABLE TO VARIABLE SHEET LENGTHS
Willi Becker, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany
Filed Jul. 18, 1977, Ser. No. 816,687
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632243
Int. Cl.[2] B41F *1/30*
U.S. Cl. 101—410 **9 Claims**



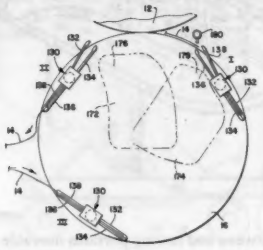
1. Printing machine sheet transfer drum adjustable to variable sheet lengths, the transfer drum being formed with transverse drum channels and having sheet carriers forming respective meshing comb-like structures adjustable relative to one another, and devices for gripping the leading and trailing edges of a sheet, the gripping devices being disposed in the drum channels and secured to the sheet carriers, the gripping devices having at least one continuous sheet-supporting rail extending from side to side of the sheet transfer drum, comprising a rigid main drum body formed of one piece with one of the comb-like structures and having at most two separable parts including the device for gripping the leading edge of the sheet, and a hollow, substantially cylindrical body partly surrounding said main drum body in circumferential direction thereof and being supported at most at two bearing locations on said main drum body, said hollow, substantially cylindrical body having a one-piece member formed with a surface for supporting a sheet over substantially the entire width thereof, the device for gripping the trailing edge of the sheet being disposed on said hollow body and forming therewith a rotatable sheet carrier unit.

4,204,472

DUPLEXING COPYING SYSTEM

Lawrence A. Borneman, Lombard, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Continuation-in-part of Ser. No. 826,847, Aug. 22, 1977. This application Aug. 7, 1978, Ser. No. 931,522
Int. Cl.[2] B41F 7/06, 21/04, 21/08
U.S. Cl. 101—426 19 Claims



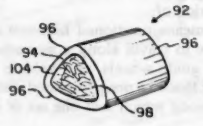
1. In a duplicating system wherein images are transferred from image carrying surfaces to copy sheets supported on a carrier, drive means for the carrier, means for feeding the copy sheets to the carrier, gripper means associated with the carrier for gripping the sheets to hold the sheets on the carrier, said gripper means comprising first and second grippers located in spaced relationship on the carrier for holding sheets on the carrier, said first gripper including means for holding the leading edge of each sheet fed to the carrier, and said second gripper including means for holding the trailing edge of each sheet fed to the carrier, the improvement wherein said second gripper comprises two separate sheet holding means independently operable relative to each other, a support mounting the respective holding means of the second gripper in oppositely directed positions, means operating one holding means of the second gripper for gripping the trailing edge of a sheet held by said first gripper, means connected to said support for inverting said second gripper after gripping of the trailing edge by said one holding means of the second gripper, and means operating the other holding means of the second gripper for gripping the trailing edge of the next sheet fed to the carrier.

4,204,473

GAS GENERATING CHARGE FOR OPEN CHAMBER GAS POWERED TOOL

David Dardick, 211 E. 70th St., New York, N.Y. 10021

Continuation-in-part of Ser. No. 738,953, Nov. 4, 1976, which is a continuation-in-part of Ser. No. 570,909, Apr. 23, 1975, Pat. No. 4,026,212, which is a continuation of Ser. No. 359,754, May 14, 1973, abandoned. This application May 17, 1978, Ser. No. 906,784
Int. Cl.[2] F42B 3/04
U.S. Cl. 102—39 11 Claims



1. An open chamber gas generating charge for an open chamber gas powered tool, comprising:

a plastic jacket of noncircular cross section containing an opening for propellant extending longitudinally throughout and through the ends of the jacket,

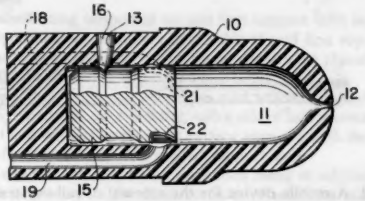
a nitrocellulose propellant disposed within said opening, said nitrocellulose being characterized as being substantially in its naturally occuring form, substantially free of mixture with material other than that normally combined with nitrocellulose in nature, and in noncompressed expanded form within said jacket, said nitrocellulose comprised of fibres of wood pulp or cotton linters of random lengths in the range of 0.004 to 0.05 inches and at nitration level in the range of 10 to 15%.

4,204,474

CALORIC INCAPACITATING LOW-LETHALITY PROJECTILE

William R. Mizelle, 1330 New Hampshire Ave., NW., Washington, D.C. 20036

Continuation-in-part of Ser. No. 767,457, Feb. 10, 1977, Pat. No. 4,091,736. This application May 30, 1978, Ser. No. 910,440
Int. Cl.[2] F42B 11/36
U.S. Cl. 102—92.7 9 Claims



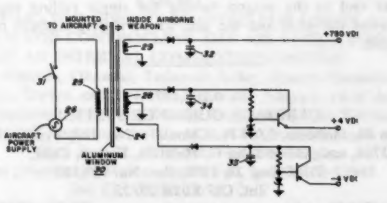
1. A low-lethality projectile whereby a human or animal target within a selected range is incapacitated, notwithstanding the projectile's having a weight and mass light enough to make it unlikely to inflict a serious penetrating or blunt-trauma wound, having in a chamber of suitable form within the projectile means for admitting and trapping a portion of the hot powdergas of cartridge firing; and means for impinging said contained hot powdergas upon the intended target.

4,204,475

ARMING-SAFING SYSTEM FOR AIRBORNE WEAPONS

Ronald J. Fowler, Columbus, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1969, Ser. No. 823,243
Int. Cl.[2] F42C 15/12, 15/40, 13/04, 11/04
U.S. Cl. 102—262 6 Claims



1. A system for arming an airborne weapon in time delayed relation with respect to the release of the weapon from an aircraft in flight, the aircraft being provided with a mechanically modulated source of gamma radiation for irradiating a predetermined volume of space below the aircraft, comprising:

means for detecting gamma radiation;

means for comparing the magnitude of the detected radiation with a predetermined value and for generating a pulse each time the radiation exceeds that value;

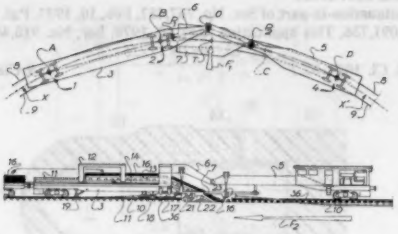
a low pass filter for receiving the pulses generated by said comparing means; and

means operable to initiate the arming sequence for said weapon when the frequency of the filter output equals the frequency at which the radiation source is modulated.

4,204,476
MOBILE DEVICE FOR RENEWAL OF RAILWAY TRACKS

Ivo Cicin-Sain, Bussigny-pres-Lausanne, Switzerland, assignor to Matisa Materiel Industriel S.A., Lausanne, Switzerland

Filed Apr. 12, 1978, Ser. No. 896,015
Claims priority, application Switzerland, Apr. 22, 1977, 4997/77
Int. Cl.[2] E01B *29/05*
U.S. Cl. 104—2 9 Claims



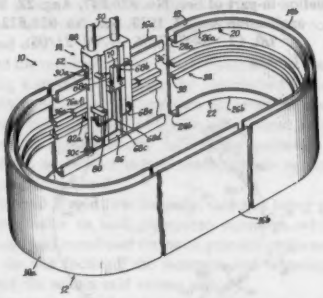
1. A mobile device for the renewal of railway tracks comprising a work tool carrying chassis adapted to ensure at least the replacement of old ties by new ones, and at least two wagons, joined together and mounted on rolling supports, at least one of which wagons is adapted for transport and the handling of material necessary for the said replacement, and one of the two wagons rolls and advances on new reconstituted track, in which the work tool carrying chassis is interposed between the rolling supports of the wagons in the work zone, and is suspended from at least one connecting member of the said two wagons, and the geometrical disposition of the supports and of the joint of the two wagons is such that the longitudinal axis of the tool carrying chassis in the plane of the railway track is automatically tangential with the longitudinal axis of the track, one of the two wagons comprising two spaced apart rolling supports and an overhanging extension over the work zone in the form of a bracket terminating in the joint, and the other wagon is directly connected at one end to the said joint and comprises a single rolling support spaced from the said joint, and the work tool carrying chassis is suspended and joined at one end to the overhanging bracket of the wagon having two spaced apart rolling supports and at the other end to the wagon having the single rolling support, between the joint and the said single rolling support of the wagon.

4,204,477
CARRIAGE GUIDANCE SYSTEM

John H. Holstein, 5304 N. Colonial - No. 102, Fresno, Calif. 93704, assignor to John H. Holstein, Fresno, Calif.

Filed Aug. 28, 1978, Ser. No. 937,195
Int. Cl.[2] E01B *25/22*
U.S. Cl. 104—106 13 Claims

1. A carriage guidance system comprising, in combination, track means defining an endless guide path having upper and lower parallel track-ways and an intermediate track-way parallel to said upper and lower track-ways, and carriage means including a carriage plate, three guide rollers mounted on said carriage plate for rotation about subtantially vertical axes, two of said guide rollers having parallel spaced axes and having guiding cooperation with one of said upper and lower track-ways, and the other of said three guide rollers having guiding cooperation with the other of said upper and lower track-ways, at least two support rollers mounted on said carriage plate for rotation about laterally spaced parallel horizontal axes, said support rollers being adapted for cooperation with said intermediate track-way so as to be movable therealong while vertically supporting said carriage plate, said intermediate track-way being defined by upper and lower plates normally disposed to maintain said support rollers in captured

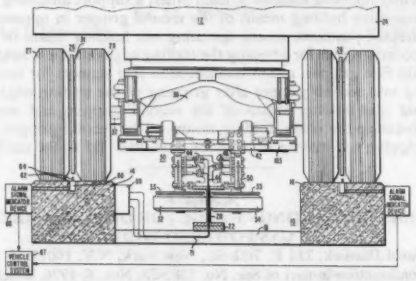


relation therebetween and having portions movable relative to each other so as to permit vertical movement of said carriage plate relative to said track means to facilitate removal of said carriage plate from said track means.

4,204,478
TRANSPORTATION VEHICLE FLAT TIRE SAFETY APPARATUS

William E. Schmitz, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 18, 1978, Ser. No. 897,326
Int. Cl.[2] B61B *15/00*
U.S. Cl. 104—247 5 Claims



1. In protection apparatus for a mass transit vehicle having support wheels operative with a roadway including spaced track surfaces and a vehicle restraining guide beam located between said track surfaces, said vehicle including at least one set of support wheels for traveling along one of said track surfaces and having guide wheels operative with said guide beam, the combination of:

vehicle support means positioned between said one set of support wheels to travel along a movement path determined by said guide wheels, said vehicle support means normally being spaced a predetermined distance above the track surface along which said one set of support wheels travels,

wheel condition sensing means coupled with said one track surface and positioned to extend above said one track surface in alignment with the movement path of the vehicle support means for determining the condition of said support wheels by sensing the vertical position of the vehicle support means traveling along said roadway track surface, and

signal providing means coupled with said sensing means and responsive to the vertical position of said vehicle support means to provide an alarm signal when the vehicle sup-

port means moves in position below said predetermined distance to come in contact with said wheel condition sensing means.

4,204,479

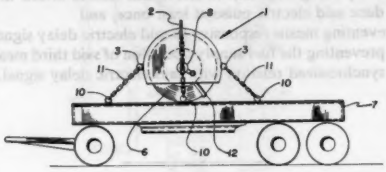
COIL CONTAINMENT COVER

Gilbert L. Rosa, 399 Prospect Cir., Lower Burrell, Pa. 15068

Filed Mar. 30, 1978, Ser. No. 891,555

Int. Cl.[2] B60P *7/02, 7/12;* **B61D** *45/00*

U.S. Cl. 206—397 **6 Claims**



1. A removable cover containment means adapted to be supported by a coil of sheet steel, the coil having a central opening therethrough, said cover and containment means comprising:

(a) a rigid cover member adapted in size and shape to fit over and to substantially enclose said coil when said coil is positioned on its peripheral surface;

(b) means extending lengthwise through the center of the coil and rigidly connecting opposed end members of the coil mounted cover by which the cover is restrained against removal in a radial direction from the supporting coil.

4,204,480

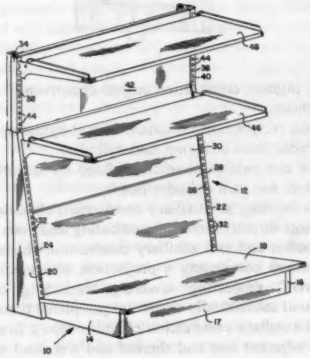
SHELVING SYSTEM

James L. Hanna, Athens, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 600,412, Jul. 30, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,669

Int. Cl.[3] A47B *57/16*

U.S. Cl. 108—108 **9 Claims**



1. A system of shelving wherein identical shelves may be mounted interchangeably on supporting members having surfaces disposed at different angles relative to the horizontal, said system comprising:

a first support having a planar front surface disposed at a first angle with respect to the horizontal, and having a series of uniformly spaced slots extending in the vertical direction on said surface,

a second support having a planar front surface disposed at a second angle with respect to the horizontal, said second angle being different from said first angle, and having a second series of uniformly spaced slots extending in the vertical direction on said surface, and

first and second substantially identical shelves, each having an article-supporting surface and at least two tabs one located above the other and both adapted to extend into slots in said supports, the uppermost of said tabs having means for engaging the rear surfaces of said supports, means defining a first surface adapted to engage the planar front surface of one of the supports, and means, on the other of said tabs, defining a second surface adapted to engage the planar front surface of the other of said supports, and

said first shelf being supported on said first support with its said uppermost tab extending into a slot of said first support and with its said first surface engaged with the planar front surface of said first support,

said second shelf being supported on said second support with its uppermost tab extending into a slot of said second support and with its said second surface engaged with the planar front surface of said second support, and

said first and second surfaces on each shelf being so related to each other and to the front surfaces of said first and second supports that, with said shelves so mounted respectively on said first and second supports, the article-supporting surface of the first shelf is substantially parallel to that of the second shelf.

4,204,481

ANTI-WEAR ADDITIVES IN DIESEL FUELS

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 2, 1979, Ser. No. 8,474

Int. Cl.[2] C10L *1/18, 1/22*

U.S. Cl. 123—1 A **42 Claims**

1. As a new composition of matter, an anti-wear compression ignition fuel for use in diesel engines comprising (1) a monohydroxy alkanol having from 1 to 5 carbon atoms, and (2) a wear inhibiting amount of an additive selected from the group consisting of fatty acid amides of diethanolamine, fatty acid esters of diethanolamine and mixtures thereof.

4,204,482

COMPARATOR CIRCUIT ADAPTED FOR USE IN A SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

Toshiro Harada, Okazaki; Tadayuki Kubo, Toyota; Kazusato Kasuya, Kariya, and Yukihiro Watanabe, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Apr. 21, 1978, Ser. No. 898,987

Claims priority, application Japan, Feb. 9, 1978, 53-12940

Int. Cl.[2] F02M *51/00, 7/12*

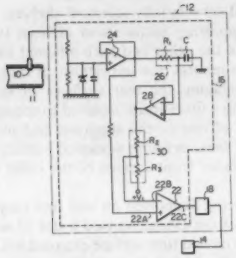
U.S. Cl. 123—32 EE **3 Claims**

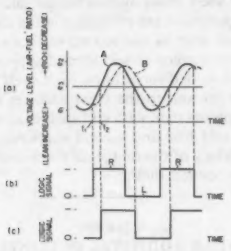
1. A method of producing, in an internal combustion engine provided with an exhaust line, logic signals "0" and "1", one of which indicates a small air-fuel ratio of the exhaust gas and the other indicates a large air-fuel ratio of the exhaust gas, said logic signals being utilized for operating an air-fuel ratio control system of the engine, said method comprising the steps of:

generating, by utilizing an air-fuel ratio sensor attached to the exhaust line, a first analogous electrical signal, the voltage level of which is periodically changed in accordance with the air-fuel ratio of the exhaust gas;

generating, by utilizing a phase control unit receiving the first analogous signal, a second analogous electrical signal, the second analogous signal having a delayed phase when compared with the phase of the first analogous signal;

comparing the voltage level of the first analogous signal with that of the second analogous electrical signal for generating one of the logic signals when the voltage level of the first analogous signal is higher than that of the second analogous signal and for generating the other logic





signal when the voltage level of the first analogous signal is lower than that of the second analogous signal; and

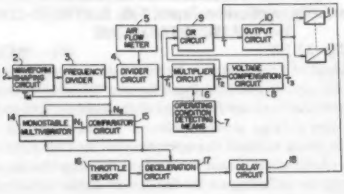
introducing the logic signals into the air-fuel ratio control system, one of the logic signals being adapted for increasing the air-fuel ratio, the other logic signal being adapted for decreasing the air-fuel ratio.

4,204,483

FUEL CUT-OFF APPARATUS FOR ELECTRONICALLY-CONTROLLED FUEL INJECTION SYSTEMS

Susumu Harada, Oobu; Toshio Kondo, Anjo, and Tomomi Eino, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 10, 1978, Ser. No. 923,306
Claims priority, application Japan, Jul. 15, 1977, 52-85465
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EL **3 Claims**



1. In an electronically-controlled fuel injection system for a combustion engine, said fuel injection system having first means responsive to the operating condition of said combustion engine and effective to produce electric condition signals indicative of said operating conditions, second means responsive to said electric condition signals and effective to produce an electric pulse signal having a time interval dependent on said operating conditions, and third means responsive to said electric pulse signal and effective to supply said combustion engine with pressurized fuel during said time interval, a fuel cut-off apparatus comprising:

deceleration detecting means responsive to the deceleration of said combustion engine for producing an electric deceleration signal indicative of said deceleration;

delay means responsive to said electric deceleration signal for producing an electric delay signal delayed in time relative to said electric deceleration signal, the interval of delay being sufficient to allow said second means to produce said electric pulse at least once; and

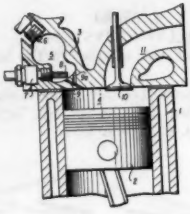
preventing means responsive to said electric delay signal for preventing the fuel supply operation of said third means in synchronized relation with said electric delay signal.

4,204,484

AUXILIARY COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE

Nobuhiro Miura, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 695,111, Jun. 11, 1976, abandoned.
This application Sep. 29, 1978, Ser. No. 947,096
Claims priority, application Japan, Jun. 24, 1975, 50-76439; Mar. 3, 1976, 51-22213
Int. Cl.[2] F02B *19/10*
U.S. Cl. 123—32 SP **14 Claims**



1. An internal combustion engine comprising:

a cylinder;

a piston reciprocably disposed in said cylinder;

a cylinder head covering said cylinder;

a main combustion chamber defined by said cylinder, said piston, and said cylinder head;

means defining an auxiliary combustion chamber;

a passage directly intercommunicating said main combustion chamber and said auxiliary combustion chamber;

said means comprising a projection, intermediate the end thereof, projecting inwardly, extending continuously around substantially the entire periphery thereof dividing said auxiliary combustion chamber into a first sub-chamber adjacent one end thereof and a second sub-chamber adjacent the other end thereof, and defining a recess in said first sub-chamber beneath said projection;

a spark plug having electrodes positioned in said recess;

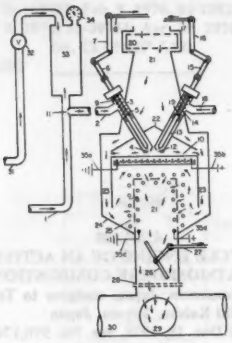
a fuel injection nozzle situated in said second subchamber so that fuel injected therefrom is directed in a direction directly toward said recess; and

said passage opens into a portion of said first subchamber spaced from said recess.

4,204,485
FUEL VAPORIZING DEVICES FOR INTERNAL COMBUSTION ENGINES

John Perepolkin, Box 3126, Castlegar, British Columbia, Canada (V1N 3H4)

Filed Jul. 20, 1976, Ser. No. 706,955
Int. Cl.[2] F02B *43/00, 43/08*
U.S. Cl. 123—34 A 9 Claims

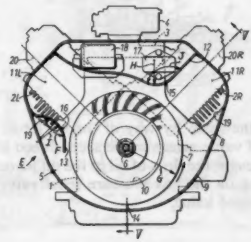


1. A fuel vaporizing device for converting liquid fuel from its liquid state into an atomized consistency of gaseous fuel vapor, said gaseous fuel vapor being for use in an internal combustion engine having an intake manifold, comprising: a heated liquid fuel vaporizing metal plate; a liquid fuel delivery control spray valve, said spray valve having spraying means incorporated therein in its lower extremity by a conventional needle valve, said needle valve having a spring loaded endwise slideable needle, said needle having its lower end tapered, said taper providing means to normally open or close a taper shaped aperture, said aperture being the discharge outlet of the said needle valve, the upper end of said needle having connectable means whereby linkages may be attached providing means for control of operation of said needle valve, said spraying means of said spray valve being positioned in optimally close proximity to the upper surface of said heated fuel vaporizing metal plate providing a diffused liquid fuel spray to issue therefrom under pressure, said liquid fuel spray being directed to impinge upon said upper surface of said heated fuel vaporizing metal plate thereby instantaneously converting said liquid fuel spray into gaseous fuel vapor, said pressure being provided by functioning action of conventionally equipped automotive fuel pump; a water delivery control spray valve, said water spray valve having spraying means incorporated therein in its lower extremity in similar fashion as is the physical design and structure of the liquid fuel delivery control spray valve described above, the only difference between the said water delivery control spray valve and the said liquid fuel delivery control spray valve being in the type of liquid each spray valve is intended to deliver in spray form to the designated destination said destination being the upper surface of said heated liquid fuel vaporizing metal plate, said water delivery control spray valve functioning to deliver water under pressure in said diffused spray form said spray directed to impinge upon said upper surface of said heated fuel vaporizing metal plate thereby instantaneously converting said diffused water spray into steam, said pressure being provided by the function of a suitable auxilliary water pump, an intake air deflector situated immediately above said fuel vaporizing metal plate in the pathway of intake air; and a heated 'fuel vapor/steam/air' mixture atomizing screen, said screen being situated in down stream sequence below the said heated fuel vaporizing metal plate.

4,204,486
COOLING SYSTEM FOR V-SHAPED, FORCED AIR-COOLED ENGINE

Itsusuke Nakagawa, and Tokuichi Aoyama, both of Sakaishi, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Apr. 5, 1978, Ser. No. 893,691
Claims priority, application Japan, Jun. 30, 1977, 52/87426[U]
Int. Cl.[2] F02F *1/34*
U.S. Cl. 123—41.6 5 Claims



1. A cooling system for a V-shaped, forced air-cooled engine, said engine including a crankcase, and first and second cylinders mounted in V form on top of the opposite sides of said crankcase, said cooling system including:

a radial flow cooling fan mounted on the front of said crankcase, and driven by said engine to rotate in a direction from said second cylinder toward said first cylinder;

a fan housing covering said fan and at least the front portions of said cylinders, said housing including first and second cooling air passageways arranged to pass cooling air from said fan to said first and second cylinders, respectively;

means within said housing defining a first threshold wall area at the downstream side of the first passageway, and a second threshold wall area at the downstream side of said second passageway;

said first passageway having a first threshold point disposed on said first threshold wall area generally in line with the downstream side of said first cylinder, said second passageway having a second threshold point disposed on said second threshold wall area generally in line with the downstream side of said second cylinder but slightly biased towards said fan, a third threshold point being disposed under said fan, the angle measured between a first line extending from said first threshold point and the center of said fan and a second line extending from the center of said fan to said second threshold point being substantially the same as the angle measured between said second line and a third line extending from said center of said fan to said third threshold point; and

said first and said second threshold wall areas, in the regions of the threshold points, being rounded, slow curves, being generally obtuse and being free of any protuberances, projections, nubs or sharply bending turns.

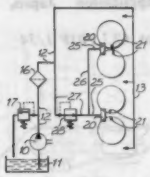
4,204,487
INTERNAL COMBUSTION ENGINES

Maurice Jones, Huddersfield, England, assignor to David Brown Tractors Limited, England

Filed Apr. 20, 1978, Ser. No. 898,236
Claims priority, application United Kingdom, Apr. 28, 1977, 17743/77
Int. Cl.[2] F01P *3/06*
U.S. Cl. 123—41.35 4 Claims

1. An internal combustion engine, of the type having at least one cylinder in which there is reciprocable a piston, comprising a lubrication system including a pump drawing oil from a sump and delivering it under pressure through a first feed line to the engine's bearings, maximum pressure relief valve means

connecting the first feed line directly to the sump, a second feed line connecting the first feed line at a point downstream of the maximum pressure relief valve means to at least one oil jet directed into the or each cylinder for cooling the piston therein, all of the oil flowing through the second feed line



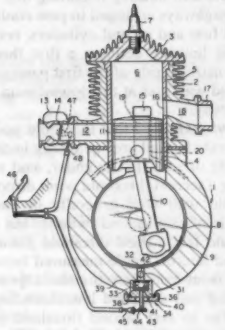
returning to the sump by way of the oil jet or jets, and low pressure relief valve means in the second feed line for closing said line to prevent the flow of oil to the oil jet or jets when the pressure acting on the low pressure relief valve means is less than a determined value.

4,204,488

2-CYCLE ENGINE OF AN ACTIVE THERMOATMOSPHERE COMBUSTION TYPE

Sigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan, a part interest

Filed Dec. 18, 1978, Ser. No. 970,173
Claims priority, application Japan, Dec. 21, 1977, 52/152947
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 A **23 Claims**



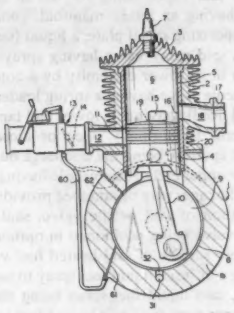
1. A 2-cycle engine comprising:
an engine body having therein a cylinder bore and a crank room which has a bottom wall;
an piston reciprocally movable in said cylinder bore, said piston and said cylinder bore defining a combustion chamber;
an intake passage having mixture forming means therein for introducing a fresh combustible mixture into said crank room;
an exhaust passage having an exhaust port opening into said combustion chamber for discharging exhaust gas into the atmosphere;
first transfer passage means having an inlet opening which opens into said crank room;
second transfer passage means communicating said first transfer passage means with an inlet port opening into said combustion chamber, said second transfer passage means having a cross-sectional area which is larger that of said first transfer passage means;
bypass passage means communicating said second transfer passage means with said crank room;
normally closed valve means arranged in said bypass passage means and actuated in response to changes in the level of the load of the engine for opening said valve means when the load of the engine is increased beyond a predetermined level, and;
ignition means arranged in said combustion chamber.

4,204,489

2-CYCLE ENGINE OF AN ACTIVE THERMOATMOSPHERE COMBUSTION TYPE

Sigeru Onishi, Kanazawa, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 18, 1978, Ser. No. 970,174
Claims priority, application Japan, Dec. 21, 1977, 52/152948
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 A **16 Claims**



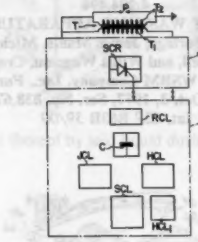
1. A 2-cycle engine comprising:
an engine body having therein a cylinder bore and a crank room which has a bottom wall;
a piston reciprocally movable in said cylinder bore, said piston and said cylinder bore defining a combustion chamber;
an intake passage having mixture forming means therein for introducing a fresh combustible mixture into said crank room;
choke means having a choke valve arranged in said intake passage for feeding a rich mixture into said crank room when the engine is started;
a transfer passage communicating said crank room with an inlet port opening into said combustion chamber;
restricting means arranged in said transfer passage at a position near said crank room for throttling the mixture stream flowing in said transfer passage;
an exhaust passage having an exhaust port opening into said combustion chamber for discharging exhaust gas to the atmosphere, and;
fuel feed means operatively connected to said choke mechanism and actuated in response to the operation of said choke mechanism for feeding fuel into said crank room when the engine is started.

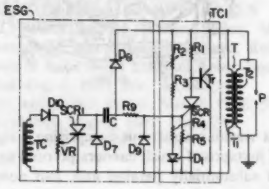
4,204,490

OVER-ROTATION PREVENTION METHOD AND CIRCUIT IN THE NON-CONTACT TYPE IGNITION CIRCUIT FOR THE INTERNAL COMBUSTION ENGINE

Yoshinori Ohki, and Komiya Hirokichi, both of Tokyo, Japan, assignors to Iida Denki Kogyo K.K., Tokyo, Japan

Division of Ser. No. 748,462, Dec. 8, 1976, Pat. No. 4,144,859.
This application May 17, 1978, Ser. No. 907,059
Claims priority, application Japan, Dec. 15, 1975, 50-149297; Dec. 15, 1975, 50-149298; Feb. 9, 1976, 51-13028; Mar. 4, 1976, 51-23592; Apr. 8, 1976, 51-39754; Apr. 16, 1976, 51-43181
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—102 7 Claims





1. A method for prevention of overrotation in a non-contact ignition circuit for an internal combustion engine, said non-contact ignition circuit comprising: an ignition coil T, the primary winding T1 of said ignition coil T carrying a primary current, said primary current controlled in its flow by the conduction or non-conduction of a thyristor SCR; onset of conduction of said thyristor causing a high voltage in the secondary winding T2 of said coil T; and, a capacitor C connected to the gate of said thyristor SCR, including the steps of:

(a) inducing a forward voltage and current flow in said primary winding T1;

(b) applying said forward voltage to said gate of said thyristor SCR whereby said thyristor SCR conducts to produce said high voltage in said secondary T2 when said gate voltage reaches the trigger voltage of said thyristor SCR;

(c) inducing an inverse voltage in said primary winding T, following said forward voltage,

(d) charging said capacitor C with said inverse voltage;

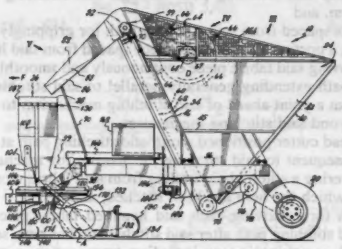
(e) discharging said capacitor C via said connection to said thyristor gate when said engine rotation rate exceeds a preselected value, whereby said thyristor SCR is non-conductive and said high voltage is not produced in said secondary winding T2 when said capacitor C discharges.

4,204,491

MOBILE PLANTING APPARATUS

Donald J. Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Mar. 29, 1978, Ser. No. 891,420
Claims priority, application United Kingdom, Apr. 7, 1977, 14700/77; Jul. 12, 1977, 29146/77
Int. Cl.[2] A01C *7/00, 5/06*
U.S. Cl. 111—3 5 Claims



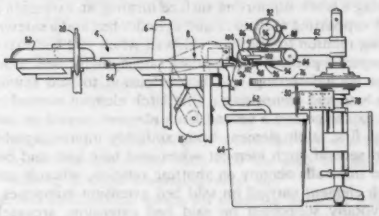
1. A mobile planting apparatus characterized by a frame including a rear main frame section, a front frame section and pivot means connecting the front frame section to the rear main frame section including a vertical pivot means and a horizontal fore and aft pivot means; ground engaging wheels attached to the rear main frame section; hitch means attached to the front frame section; a furrow opener attached to the front frame section; a billet supply hopper mounted on the rear main frame section with a billet elevator conveyor forming at least a portion of one wall of the billet supply hopper; and a billet delivery and alignment chute means including a primary billet delivery and alignment chute with an upper end mounted on the upper end of the billet elevator conveyor, a generally flat downwardly and forwardly inclined floor with decreasing width from the upper end, side flanges inclined upwardly and outwardly from each side of at least a portion of the downwardly inclined floor and a lower exit end of the primary billet delivery and alignment chute positioned adjacent a vertical axis formed by the vertical pivot means, and a downwardly and rearwardly inclined secondary billet delivery and alignment chute mounted on the front frame section with an upper end adjacent the lower exit end of the primary billet delivery and alignment chute and a lower end adjacent the furrow opener.

4,204,492

APPARATUS FOR HEMMING FABRIC PIECES

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed Jul. 17, 1978, Ser. No. 925,403
Int. Cl.[2] D05B *33/00, 81/00*
U.S. Cl. 112—121.29 4 Claims



1. Apparatus for providing individual hemmed pieces of

fabric, comprising in combination means for hemming each said fabric piece, said hemming means comprising

means for folding an edge of each said fabric piece whereby a hem is formed for stitching,

a sewing machine for stitching said hem with said stitching forming a stitching chain between successive said fabric pieces, said sewing machine including both a stitching mecahnism and means positioned along a predetermined stitching path for feeding each said fabric piece step-wise along said stitching path through said stitching mechanism, and

means spaced from said stitching path for grippingly engaging a portion of said fabric piece spaced from said hem and moving said fabric piece continuously and smoothly along a path extending generally parallel to said stitching path from a point ahead of said stitching mechanism to a point beyond said stitching mechanism;

a thread cutter positioned along said stitching path at a point subsequent to said stitching mechanism for mechanically severing a stitch chain trailing from said fabric workpiece in which the hem has been stitched; and

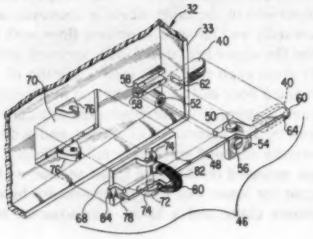
means for removing each said hemmed fabric piece from said stitching path after said stitch chain has been severed, said removing means including transporting means for releasably gripping and transporting a fabric piece from said stitching path to a receiving position where said fabric piece is released, and sensor means for sensing the presence of a fabric piece in position for removal and then activating the gripping and transporting means.

4,204,493

SEWING MACHINE BED EXTENSION LATCH

John Blackwood, Union, and Ronald Iannarone, Hillside, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,775
Int. Cl.[2] D05B 75/00
U.S. Cl. 112—260 **3 Claims**



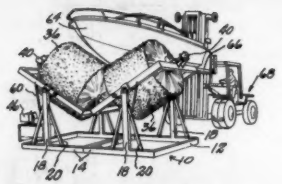
1. A sewing machine bed extension latch for a convertible bed sewing machine having a base, a sidewall carried by said base, a freely supported cylinder bed having a work supporting surface including a stitch forming area extending from said base for accepting tubular work pieces to be sewn thereon, and a work feeding mechanism for transporting work pieces in a direction transversely across said cylinder bed, a removable bed extension surrounding said cylinder bed, said bed extension having a work supporting surface forming an extension of the work supporting surface of said cylinder bed and a sidewall in abutting relation to said base sidewall when said bed extension occupies a position surrounding said cylinder bed, a bed extension latch fastening said bed extension to said sewing machine base and comprising a first latch element carried on said bed extension and a second latch element carried on said base, said first latch element being shiftably interengageable with said second latch element when said base and said bed extension sidewalls occupy an abutting relation, wherein said first latch element carried on said bed extension comprises a lever pivotally supported on said bed extension, arcuately rotatable operator influenced means carried on said work supporting surface of said bed extension and away from said stitch forming area in the direction of work feeding for disengaging said first pivotally supported latch element form said second latch element carried on said base, and spring means fastened to said first latch element for urging said first shiftably supported latch element into a position for interengagement with the other of said latch elements carried on said base when said bed extension sidewall is in an abutting relation with said base sidewall.

4,204,494

BOAT WASHING APPARATUS

Glenn D. Bridwell, Portage; James Maule, Michigan City; Alois Schrombeck, Lowell, and Willis Wognum, Crown Point, all of Ind., assignors to WSBM Company, Inc., Portage, Ind.

Filed Oct. 3, 1977, Ser. No. 838,674
Int. Cl.[2] B63B 59/00
U.S. Cl. 114—222 **4 Claims**



1. A boat washing apparatus comprising a rigid frame,

a pair of juxtaposed brush carriers pivoted to said frame on spaced substantially parallel axis, and normally substantially horizontally positioned, a cylindrical brush journaled in each carrier on an axis substantially perpendicular to the pivot axis of said carrier, and normally substantially horizontally positioned and substantially axially aligned with the brush journaled in the other carrier, means for limiting pivoting of said carriers, and means for rotating each brush, said carrier pivot limiting means being adjustable.

4,204,495

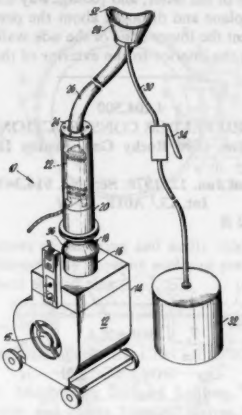
APPARATUS FOR APPLYING A LIQUID TO A SURFACE

Jay S. Wyner, Sands Point, N.Y., assignor to Therma-Plex, Long Island City, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,357
Int. Cl.[2] B05C 5/00
U.S. Cl. 118—300 **9 Claims**

1. Apparatus for applying a liquid to a surface, comprising a tank for supplying said liquid, an air blower for supplying a stream of air, a nozzle adaptable for being placed against said surface, hose means interconnecting said nozzle to said blower and said tank for aspirating said liquid from said tank during the operation of said blower, a rotary fan mounted on said air blower, an apertured plate positioned adjacent said fan, said

fan and plate being positioned in the path of said air stream, whereby a pulsating liquid-air mixture is applied to said surface



for impregnation thereof by said liquid during the operation of said blower.

4,204,496

STEEL-PIPE COATING APPARATUS

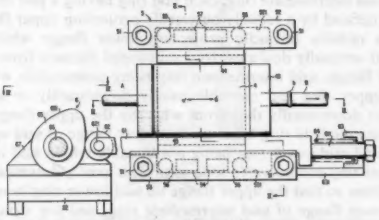
Yoshio Ikegami, Miki; Tadashi Kohge, Kobe; Masakatsu Kawahara, Amagasaki, and Hirofumi Kimura, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Aug. 5, 1977, Ser. No. 822,321

Claims priority, application Japan, Nov. 8, 1976, 51-134315; Nov. 8, 1976, 51-134316; May 4, 1977, 52-51378

Int. Cl.[2] B05C *5/02*

U.S. Cl. 118—405 **10 Claims**



1. A steel-pipe coating apparatus for continuously extruding resin for coating said steel pipe therewith including a fixed frame and a cross head die movably mounted with respect to said frame having a resin inlet, an axially extending steel pipe guide passage, and a resin extruding outlet which is open at an exit of said steel pipe guide passage in the form of a tubular clearance surrounding the surface of said steel pipe, which comprises:

an extruder secured to said frame;

a resin extruding outlet in said extruder being communicated through a resin guide member with said resin inlet in said cross head die, thereby introducing a coating resin from said extruder to said cross head die; and

reciprocating drive means for supporting and reciprocably moving said cross head die relative to said extruder within a given stroke in said axial direction of steel-pipe guide passage.

4,204,497

ELECTROSTATIC COATING APPARATUS HAVING CONVEYOR BELT, FLUIDIZING AND ELECTROSTATIC MEANS FOR RECIRCULATION OF COATING PARTICLES

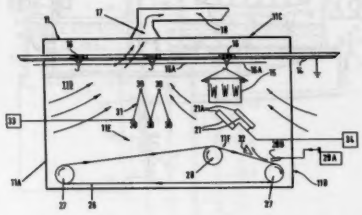
Robert C. Lever, London, England, assignor to Volstatic Holding Limited, United Kingdom

Filed Sep. 5, 1978, Ser. No. 939,368

Claims priority, application United Kingdom, Sep. 14, 1977, 38356/77

Int. Cl.[2] B05B *5/02*

U.S. Cl. 118—634 **8 Claims**



1. In an installation, for electrostatically depositing solid particles of dielectric coating material on an article, in which:

a booth provides a roof portion, a floor portion and two opposite side wall portions respectively extending between opposite sides of the roof portion and opposite sides of the floor portion to define a passageway having open inlet and outlet ends;

air flow inducing means are provided for inducing an inward flow of air along the passageway from the inlet and outlet ends of the passageway to a pressure sink disposed between said inlet and outlet ends;

conveyor means are provided for transporting articles to be coated along a path through the passageway, from the inlet end to the outlet end;

a powder spray gun, disposed between said outlet end and said pressure sink is provided with dispensing means for directing a cloud of particles of coating material into the path of the articles passing through the passageway, and first electrostatic means for ensuring that the majority of coating particles issuing from the powder spray gun and the articles have different electrostatic potentials, to promote the deposition of the particles on the articles;

the improvement comprising:

an endless conveyor belt of dielectric material which is mounted between the opposite side wall portions of the booth, has an upper reach, with an outlet end portion, extending throughout the length of the passageway so as to provide the floor portion of the booth, and is drivable so that the upper reach moves from said inlet end of the passageway to said outlet end;

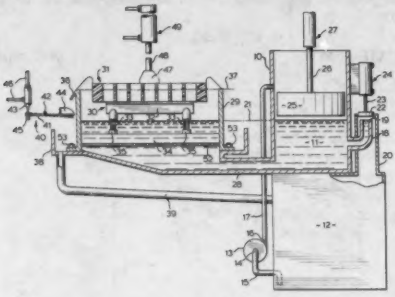
at least one nozzle disposed at or adjacent said outlet end of the passageway and means for directing a stream of gaseous medium through each said nozzle onto the outlet end portion of the upper reach, in a direction having a component extending towards said inlet end of the passageway from said outlet end so as to cooperate with the endless conveyor belt to form fluidising means for redirecting particles of coating material which fall towards the floor portion of the booth back into the path of the articles passing through the passageway; and

second electrostatic means for charging particles which are re-circulated by the fluidising means so that these particles have a different electrostatic potential to the articles.

4,204,498
APPARATUS FOR APPLYING COATING LIQUID TO ARTICLES

Emil Ivancic, 26 Frolick Crescent, Scarborough, Ontario, Canada (M1G 3E7)

Filed May 31, 1978, Ser. No. 911,132
Int. Cl.[2] B05C *11/00, 11/10*
U.S. Cl. 118—693 12 Claims

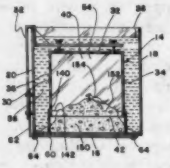


1. Apparatus for applying a coating liquid, the apparatus comprising a container for coating liquid in which articles to be coated by the liquid are mountable, a storage tank for the liquid, a pump having an inlet in communication with the storage tank and an outlet in communication with the container for continuously supplying the liquid from the storage tank to the container while the apparatus is in operation, an overflow means provided by the container and by which the liquid may return from the container to the storage tank for maintaining the liquid in the container at a predetermined level, a valve associated with the overflow means and having a normally open condition in which the valve permits return of the liquid by way of the overflow means from the container to the storage tank, and a closed condition in which the valve prevents return of the liquid by way of the overflow means from the container to the storage tank, and a displacement member mounted for movement within the container to displace the liquid therein above said predetermined level when the valve is in the closed condition thereof.

4,204,499
NEWT SANCTUARY

Rodolfo M. Leyva, 1318 W. 11th, Odessa, Tex. 79761, and James E. Allison, Jr., 3687 W. 13th - Apt. 6G, Wichita, Kans. 67203

Filed Oct. 10, 1978, Ser. No. 950,232
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 16 Claims

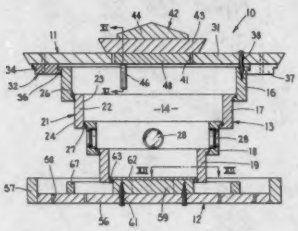


1. An aquarium accessory comprising a housing that includes a transparent top wall from which peripherally depends a transparent side wall having a lower edge that is in its entirety spaced below the top wall, said housing having an open bottom and being adapted to be received within and submerged below water in an aquarium, said walls being of a material impervious to air, means including a forced air pump for introducing atmospheric air into the housing whereby air can be entrapped in the housing above water in which the latter may be submerged, mounting means for mounting the housing within an aquarium in such a manner as to oppose buoyance forces of the latter, and passageway means disposed in a horizontal plane and disposed about the periphery of the side wall adjacent the lower edge of the side wall for allowing air to pass from the interior to the exterior of the housing.

4,204,500
BIRD FEEDER CONSTRUCTION

Walter H. Podjan, 1500 Rocky Gap, Benton Harbor, Mich. 49022

Filed Jun. 12, 1978, Ser. No. 914,343
Int. Cl.[2] A01K *39/01*
U.S. Cl. 119—52 R 4 Claims



1. A bird feeder having vertically spaced top and base structures joined together by a tubular sidewall structure which defines therein a feed storage compartment, comprising the improvement wherein said sidewall structure includes a plurality of concentric and coaxially aligned rings which telescopically fit one within another when said sidewall structure is in a collapsed position whereby the top and base structures are positioned vertically closely adjacent one another, said rings having cooperating stops which limit the axial expansion of said sidewall structure so that said rings define an axially elongated tubular structure which provides a desired maximum vertical spacing between said top and base structures, said plurality of rings including an upper ring, a lower ring and at least one intermediate ring, each said ring having a pair of said stops defined by a radially outwardly projecting upper flange and a radially inwardly projecting lower flange which is spaced vertically downwardly a substantial distance from said upper flange, said intermediate ring being positionable within said upper ring and movable axially downwardly so as to project downwardly therefrom whereby the upper flange on said intermediate ring bears on the lower flange of said upper ring, and said lower ring being positionable within said intermediate ring and movable so as to project axially downwardly therefrom so that the upper flange on said lower ring bears on the lower flange of said intermediate ring, said top structure including top plate means having guide means associated with the bottom side thereof, said guide means defining sidewardly opening side rail means for slidably supporting thereon the top flange of said upper ring, whereby said upper ring can be sidewardly slidably displaced relative to said top structure so as to be separated therefrom.

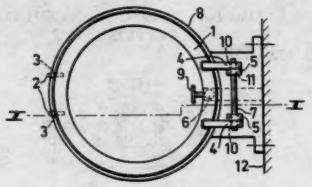
4,204,501
ANTI-LICK RING FOR AUTOMATIC DRINKING TROUGHS FOR ANIMALS

Rune Karlsson, and Berit Karlsson, both of Blacksta P1 5133, Nyköping, Sweden (S-611 00)

Filed Jul. 19, 1978, Ser. No. 925,977
Claims priority, application Sweden, Jul. 29, 1977, 7708717
Int. Cl.[2] A01K *7/00*
U.S. Cl. 119—72 8 Claims

1. An anti-lick ring for an animal drinking trough comprised of a ring having upper and lower surfaces and an outside diameter slightly smaller than the inside diameter of said drink-

ing trough; attachment pins attached to said ring so as to mate with associated apertures in said trough; said pins being on



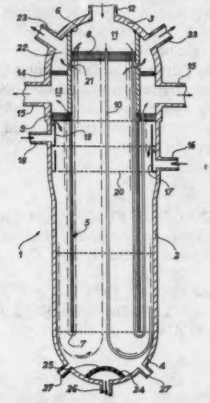
different diameters of said ring and easily releasable attachment means diametrically opposite said pins preventing longitudinal movement of said pins.

4,204,502

ONCE-THROUGH FORCED-CIRCULATION STEAM GENERATOR

Jean Forestier, Montrouge; Bernard Leblanc, Paris; Marcel Monteil, Broca, and Pierre Monteil, Esvres, all of France, assignors to Commissariat a L'Energie Atomique, Paris, France

Filed May 2, 1978, Ser. No. 902,251
Claims priority, application France, May 16, 1977, 77 14888
Int. Cl.² F22B *1/06*
U.S. Cl. 122—32 **7 Claims**



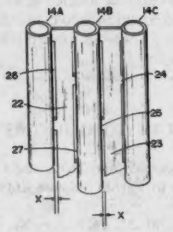
1. A once through forced circulation steam generator for heat exchange between a primary fluid and a secondary fluid, comprising an outer shell constituted by a lateral wall having a generally cylindrical shape and a vertical axis, a bottom dished end and a top dished end closing said outer shell, an inner skirt which is coaxial with said outer shell and delimits an annular space with said lateral wall, the lower end of said skirt being such as to have a free edge located at a distance from said bottom dished end, a central tube plate extending horizontally in the vicinity of said top dished end, a peripheral tube plate which is parallel to the central tube plate and placed within said annular space beneath said central tube plate, a bundle of tubes each having the shape of a J, an inlet header delimited on the one hand by said central tube plate and by said top dished end and on the other hand by a toric outlet header said outlet header being partly delimited by said peripheral tube plate and said lateral cylindrical wall, said outlet header being located above said annular space, at least one inlet nozzle opening into said annular space beneath said peripheral tube plate, and a lateral chamber placed within said shell between said inlet and outlet headers, said tubes being provided for the circulation of said primary fluid between said inlet and outlet headers, said nozzles serving to feed said secondary fluid in liquid form, said lateral chamber serving for collecting the said secondary fluid steam produced in contact with said tubes.

4,204,503

FLUID DYNAMIC SOOT BLOWER SYSTEM

Richard J. Reilly, 1759 Venus Ave., St. Paul, Minn. 55122, and John K. Moorhead, 6701 W. Trail, Edina, Minn. 55435

Filed May 30, 1978, Ser. No. 910,205
Int. Cl.² F22B *37/52*
U.S. Cl. 122—392 **4 Claims**



1. A fluid dynamic cleaning system for cleaning the heat transfer tubes on the inside surface of furnace walls comprising in combination:

interior furnace walls comprising a plurality of generally parallel heat transfer tubes and spacers between said tubes connecting the tubes together;

a cleaning fluid manifold on the furnace extending over the outside surface of said interior furnace walls;

supply means to supply a pressurized cleaning fluid to said manifold;

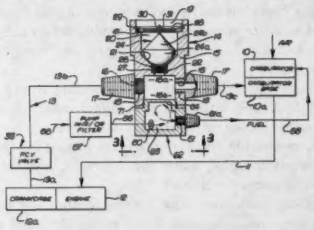
a plurality of entrance openings in the edges of said spacers in positions along the surfaces of the heat transfer tubes, said openings connected to said manifold so as to receive fluid therefrom and direct said fluid generally orthogonally to the length of the tubes and tangentially to the surface of the tubes, said heat transfer tubes having curved fluid attachment surfaces thereon operable to retain the flow of fluid thereacross.

4,204,504

FUEL HEATING, AIR METERING VALVE UNIT FOR ENGINE AIR INLET SYSTEM

John W. Dabrio, 10343 Slater, Apt. 202, Fountain Valley, Calif. 92708

Filed May 15, 1978, Ser. No. 906,114
Int. Cl.² F02M *31/00*
U.S. Cl. 123—119 B **9 Claims**



1. In a system to supply liquid fuel, crankcase gas, and air to

the fuel/air intake of an internal combustion engine, wherein the improvement combination comprises

(a) an air metering valve unit having first inlet and outlet means for a stream of hot crankcase gas,

(b) said unit having a valve controlled side entrance for air to be metered to said crankcase gas stream,

(c) said unit having second inlet and outlet means for a stream of fluid fuel,

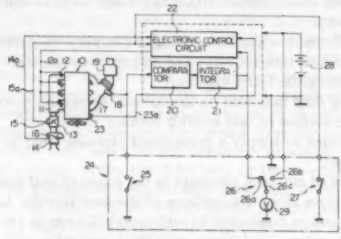
(d) and said unit including a chamber located in heat transfer relation with said crankcase gas, said chamber connected in series with said second inlet and outlet means to receive said fuel for heat transfer thereto from said crankcase gas, said unit including a partition separating the fuel stream in said chamber from the hot crankcase gas stream in said unit, said side entrance located in such air directing alignment with said partition as to cause the entering air flow to deflect the hot gas stream toward the partition to enhance said heat transfer.

4,204,505

BASIC AIR-FUEL RATIO ADJUSTMENT METHOD AND APPARATUS

Mitsuo Kawai, Okazaki, and Hironobu Ono, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 31, 1978, Ser. No. 929,718
Claims priority, application Japan, Nov. 14, 1977, 52-135619
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 EC **10 Claims**



1. A basic air-fuel ratio adjustment method for an internal combustion engine having means for detecting the air-fuel ratio of an air-fuel mixture supplied to said engine, means for generating an air-fuel ratio compensation signal having a level which increases or decreases in accordance with the detected ratio, means for holding the level of said compensation signal at a level which is determined in accordance with a power supply voltage, during a specific operating condition where the air-fuel ratio feedback control operation is stopped, means for supplying said engine with an air-fuel mixture of a ratio corrected in accordance with the level of said air-fuel compensation signal, so that the air-fuel ratio of the supplied air-fuel mixture becomes equal to a desired value, and means for presetting a basic air-fuel ratio which is equal to a ratio of the air-fuel mixture supplied to the engine when the air-fuel ratio feedback control operation is stopped, said method comprising the steps of:

measuring a signal level corresponding to the level of said air-fuel ratio compensation signal when the air-fuel ratio feedback control operation is stopped;

then, measuring the average level of said air-fuel ratio compensation signal when the feedback control operation is being carried out; and

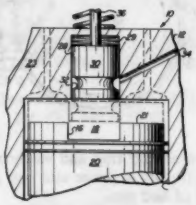
adjusting said presetting means so that the difference between said measured level when the feed back control operation is stopped and said measured average level when the feedback control operation is carried out becomes equal to a predetermined value.

4,204,506

FUEL DELIVERY SYSTEM

William M. Bowling, 5321 E. Calle Del Medio, Phoenix, Ariz. 85018

Filed Feb. 25, 1977, Ser. No. 771,962
Int. Cl.[2] F02M *59/02*
U.S. Cl. 123—137 **4 Claims**



1. A fuel delivery system for a combustion engine having an engine block defining a cylinder bore, a piston reciprocal in the bore and defining with the bore a combustion area, intake and exhaust valves for controlling the admission of air to and exhaust combustion gases from a combustion area, said fuel delivery system comprising:

(a) a fuel chamber in the engine block independent of said intake and exhaust valves, said fuel chamber being in open communication with said combustion area;

(b) a fuel conduit communicating with said fuel chamber;

(c) valving means within said fuel chamber, said fuel chamber and valving means defining a fuel port therebetween;

(d) means for actuating said valving means from a first position communicating said fuel conduit and said fuel port and in which said first position said fuel port is isolated from said combustion area to a second position placing said fuel port directly in said combustion area and isolating said fuel conduit from said fuel port; and

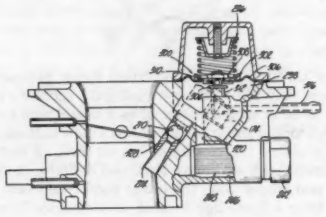
(e) dampening means associated with said valving means for permitting limited movement of said valving means to dampen ignition shock.

4,204,507

FUEL ELECTRIC FUEL INJECTION VALVE

Gary L. Casey, Troy, and Granville Hurlong, Jr., Detroit, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 17, 1977, Ser. No. 778,638
Int. Cl.[2] F02B *33/00*; B05B *1/30*
U.S. Cl. 123—139 AW **5 Claims**



1. A fuel control system for use with an internal combustion engine having a source of fuel supply, throttle body means mounted on the engine having throat means for delivering fuel to the engine and means for delivering fuel from the supply to the throttle body, said control system comprising fuel bowl means formed as part of the throttle body means having a cavity formed therein and an inlet connecting said cavity to the pump means for receiving pressurized fuel from said pump means, said fuel bowl means having an outlet formed therein communicating said cavity with the throat means, and injector

means disposed contiguous with said outlet and positioned in said fuel bowl means for directly controlling the flow of fuel in pulses from said cavity to the throat means, said injector having means formed therein forming a valve seat open to said fuel bowl, said injector means being supported in said outlet by said valve seat forming means being slip-fitting into said outlet and being retained in said outlet by said pressurized fuel.

4,204,508

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

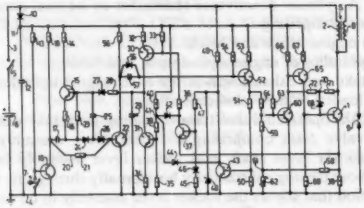
Werner Jundt, Ludwigsburg; Bernd Bodig, Leinfelden; Herman Roozenbeek, Schwieberdingen, and Peter Werner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,869

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701967

Int. Cl.² F02P *3/00*

U.S. Cl. 123—148 E **18 Claims**



1. In an ignition system of an internal combustion engine having

an ignition coil having a primary winding (2), controllable switch means having a conductive and a non-conductive state connected in series with said primary winding, a source of d-c voltage (6, 5) connected across the so-formed series circuit, and ignition signal furnishing means (7) for furnishing an ignition signal switching said controllable switch means to said non-conductive state at the desired ignition time, apparatus for decreasing the time said controllable switch means is in said non-conductive state and increasing the time said controllable switch means is in said conductive state between successive ignition times, comprising, in accordance with the invention,

a control capacitor (17);

first circuit means (14, 15, 16, 18) connected to said control capacitor and said ignition signal furnishing means, for changing the charge on said control capacitor in a first direction upon receipt of said ignition signal;

integrator means (29) for furnishing an integrator signal varying as a function of changes in speed of said internal combustion engine;

second circuit means (27, 28) for connecting said integrator means to said first circuit means in such a manner that the rate of change of charge on said control capacitor varies as a function of said integrator signal; and

additional circuit means connected between said control capacitor and said controllable switch means, for switching said controllable switch means to said conductive state when the charge on said control capacitor is a predetermined charge.

4,204,509

CURRENT INTERRUPTION TYPE IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

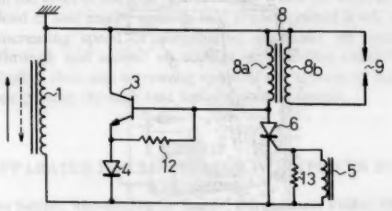
Hirotoshi Nanjo, Susono, and Takeshi Watanabe, Fuji both of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Jul. 3, 1978, Ser. No. 921,714

Claims priority, application Japan, Jul. 6, 1977, 52-80591

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **4 Claims**



1. A current interruption type ignition system for an internal combustion engine comprising an ignition coil including a primary coil portion and a secondary coil portion; an exciter incuding an AC voltage in synchronism with rotaton of said engine to be supplied to said primary coil portion of said ignition coil; a first semiconductor switch provided in parallel to said primary coil portion to conduct a current from said exciter through said first semiconductor switch; a second semiconductor switch provided on a controlled terminal of said first semiconductor switch so that said second semiconductor switch, upon conduction thereof, causes said first semiconductor switch to be turned off so as to abruptly conduct a primary current from said exciter into said primary coil portion of said ignition coil; and a signal source generating an ignition signal at the ignition position of said engine, characterized in that said second semiconductor switch is provided in series to said primary coil portion of said ignition coil while said first semiconductor switch has the controlled terminal connected through said primary coil portion of said ignition coil to said exciter whereby said first semiconductor switch is turned on by a signal applied by said exciter through said primary coil portion of said ignition coil.

4,204,510

RPM GOVERNOR FOR FUEL INJECTED INTERNAL COMBUSTION ENGINES

Ernst Ritter; Reinhard Schwartz; Rolf Müuller, all of Stuttgart; Waldemar Sturm, Renningen, and Werner Faupel, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 2, 1977, Ser. No. 830,285

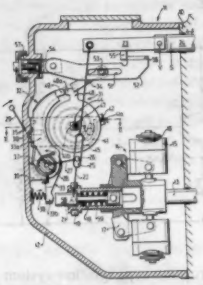
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639961

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 L **8 Claims**

1. An rpm governor for fuel injected internal combustion engines such as diesel engines including a fuel injection pump having a fuel supply adjusting member comprising, a housing, an automatically adjustable, rem-dependent regulating member, an intermediate lever for connecting said regulating member with the fuel supply adjusting member of the fuel injection pump, a counter stop connected to said fuel supply adjusting member, a stop member movable into a position for engagement with said counter stop to limit the maximum fuel supply quantity in the normal operational range of said regulating member, an rpm-controlled starting device including a control lever mounted in said housing and coupled with said stop member said regulating member being arranged to engage said control lever when the governor is not operating or when the engine is operating at an rpm below the minimum idling rpm, said stop member being pivotally articulated on said housing

and coupled to said control lever, a return spring for yieldingly holding said control lever in its normal position when it is non-engaged by said regulating member, said starting device including a thermostat which is connected with said control lever whereby at least a part of said control lever engages said stop member which is held in a position for limiting the travel of said counter stop when the engine is above a predetermined



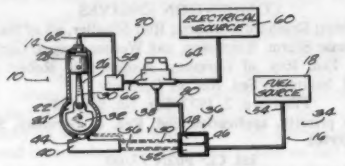
operating temperature, means for holding said stop member in said counter stop travel limiting position including when said control lever is engaged by said regulating member, said thermostat being arranged to allow movement of said stop member into a position out of engagement with said counter sotp for permitting said control lever to be acted upon by said regulating member to provide an increased starting fuel quantity when the engine is cold.

4,204,511

COMBINATION IGNITION SWITCH AND FUEL PRIMING SYSTEM

Richard L. Morris, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 19, 1979, Ser. No. 4,653
Int. Cl.[2] F02M 1/16; F02N 17/00
U.S. Cl. 123—187.5 R **19 Claims**



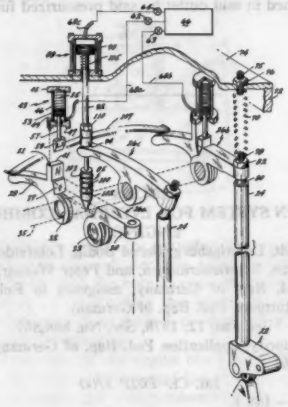
1. An engine comprising a combustion chamber, fuel delivery means communicating with said combustion chamber and adapted for connection to a fuel source, said fuel delivery means being operative for pumping fuel into said combustion chamber, means for igniting fuel in said combustion chamber, switch means operatively connected with said fuel ignition means and operatively movable between an off position for preventing operation of said fuel ignition means and an on position for permitting operation of said fuel ignition means, and means operatively connected with said fuel delivery means and said switch means for operating said fuel delivery means to pump fuel into said combustion chamber simultaneously with movement of said switch means between said off position and said on position.

4,204,512

CYLINDER DEACTIVATOR SYSTEM

Horace T. Brock, Jr., Box 238, Ehrenberg, Ariz. 85334

Filed Mar. 27, 1978, Ser. No. 890,692
Int. Cl.[2] F02D 13/06
U.S. Cl. 123—198 F **9 Claims**



1. A cylinder deactivator system for an internal combustion engine comprising:

an engine block and head,

a plurality of engine cylinders in said block;

intake and exhaust valves for each engine cylinder spring loaded to their closed positions,

a cam operated valve train operating each said valve, said valve train comprising a rocker lever assembly and a rocker lever shaft, said rocker lever assembly having a bore passing substantially horizontally through its midsection that allows the rocker lever assembly to be rockingly connected to said rocker lever shaft passing therethrough, one end of said rocker lever assembly receiving the top of a push rod,

said rocker lever assembly comprising a first member and a second member that are joined at the midsection of the rocker lever assembly with each member having aligned horizontal bores at their ends adjacent the midsection through which passes said rocker lever shaft,

a fluid pressure means for deactivating the rocker lever assembly normal downward operational force exerted against the coiled spring assembly that functions to keep the valve closed.

4,204,513

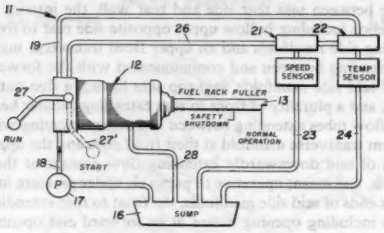
HYDRAULIC SAFETY MECHANISM

Robert A. Bilbrey, Orinda; William O. Munroe, Rodeo, and David G. Powell, Monrovia, all of Calif., assignors to California Controls Company, Berkeley, Calif.

Filed Nov. 15, 1978, Ser. No. 960,953
Int. Cl.[2] F02B 77/00
U.S. Cl. 123—198 DB **32 Claims**

1. A hydraulic safety mechanism for a system wherein a control element of the system is to be moved from a normal operating position in response to a decrease of pressure in a hydraulic portion of the system, comprising a housing forming a cylinder having one end in communication with the hydraulic portion of the system said housing also forming a fluid drain, a piston being reciprocably arranged in said cylinder and operatively connected with the control element of the system, said piston being movable between a first position adjacent said one end of the cylinder and a second position spaced apart therefrom, said piston and cylinder including means for hydraulically blocking said cylinder from said fluid drain when

said piston is in its second position and for opening said cylinder into communication with said fluid drain as said piston is moved from its second position toward its first position, means resiliently urging said piston toward its first position, hydraulic pressure in said one end of said cylinder hydraulically latching said piston in its second position in order to maintain the control element of the system in its normal operating position, said piston being responsive to a decrease of pressure in the cylinder for communicating the cylinder with the drain in order to hydraulically unlatch the piston and allow it to rapidly move toward its first position whereupon the control element is shifted from its normal operating position.



4,204,514

SPLIT OPERATION TYPE MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

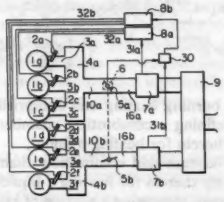
Yasuhiko Ishida, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 30, 1978, Ser. No. 964,823

Claims priority, application Japan, Dec. 19, 1977, 52-151634

Int. Cl.² F02D *17/00*

U.S. Cl. 123—198 F **16 Claims**



1. An internal combustion engine having a plurality of cylinders which are divided into a first cylinder group and a second cylinder group, said first cylinder group having a first intake passage, said second cylinder group having a second intake passage, said engine comprising:

a first air control means arranged in said first intake passage for controlling an amount of intake air fed into said first cylinder group;

a first fuel supplying means for supplying said first cylinder group with an amount of fuel in accordance with the amount of intake air passing through said first intake passage;

a second air control means for controlling an amount of intake air fed into said second cylinder group, said second air control means allowing an inflow of air into said second cylinder group when the level of a load of said engine is lower than a predetermined level;

a second fuel supply means for supplying said second cylinder group with an amount of fuel in accordance with the amount of intake air passing through said second intake passage, said fuel supply operation being carried out, when the level of the load of said engine is higher than said predetermined level, said second fuel supply means stopping said fuel supplying operation into said second cylinder group when the level of the load of said engine is lower than said predetermined level, and;

an actuating means for increasing an amount of intake air passing through said first air control means in accordance with an increase in the level of the load of said engine, and for increasing an amount of intake air passing through said second air control means in accordance with an increase in the level of the load of said engine when the level of the load of said engine exceeds said predetermined level, said increasing speed of the amount of intake air passing through said second air control means being controlled higher than said increasing speed of the amount of intake air passing through said first air control means.

4,204,515

APPARATUS FOR MACHINING WORKPIECES BY ABRASION

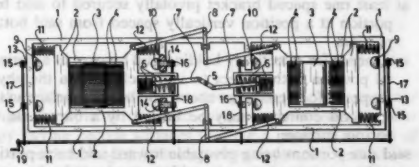
Dieter Seifert, Marktl; Dieter Regler, Burghausen; Volker Ofenmacher, Burghausen; Alfred Moritz, Burghausen; August Freudlsperger, Neuötting, and Walter Berger, Simbach, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Aug. 17, 1978, Ser. No. 934,770

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739257

Int. Cl.² B28D *1/06*

U.S. Cl. 125—16 R **4 Claims**



1. An apparatus for machining workpieces by abrasion by means of a multiple tool which oscillates across the workpiece, comprising:

a machine housing having at least a frame which has a pair of opposite sides defining at least one compartment;

tool carriage means disposed for movement within said compartment, said carriage means having a multitude of parallel, spaced-apart blades disposed across the workpiece;

at least one opposite pair of buffers for contact with said carriage means during movement, said buffers comprising a plurality of resilient storage springs having a progressive characteristic curve, said springs being mounted on threaded shafts coupled through the opposite sides of said frame, a gear mounted on each spring shaft, a chain coupled to each of said gears, and a common chain drive coupled to each chain for simultaneously adjusting all of said buffers, so as to control the oscillation of said carriage means; and

drive means coupled to said carriage means for oscillating said carriage means between said buffers, wherein said drive means includes intermediary resilient coupling means for coupling said drive means to the tool carriage.

4,204,516

BACK-PACKING STOVE FOR A SIERRA-TYPE CUP

Gene B. Figura, 1502 Linden Dr., Ames, Iowa 50010

Filed Jan. 30, 1978, Ser. No. 873,257

Int. Cl.² F24C *1/16*

U.S. Cl. 126—9 R **6 Claims**

1. A collapsible back-pack cook stove for supporting a

burner and at least one food container to be heated by the burner, comprising,

a container comprising a back portion, two opposite side portions, a top portion, and a bottom portion; said side portions being of substantially equal size;

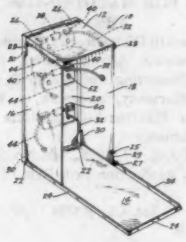
said back and bottom portions being of substantially equal size;

first means pivotally connecting said side portions to the sides of said back portion;

second means pivotally connecting one end of said bottom portion to the bottom of said back portion;

third means pivotally connecting said top portion to the top edge of said back portion;

said bottom portion adapted to lie flat for supporting a burner thereon with said back portion extended upwardly therefrom;



at least one spaced bracket pivotally secured to said back portion at a position vertically spaced from said bottom portion;

and means for selectively holding said bracket in a horizontal position with respect to said back portion thereby to support a food container above said bottom surface so that the food container may be heated by a burner on the bottom surface;

said side portions being pivotable toward said back portion, said top portion being pivotable toward said back portion and said bottom portion being pivotable toward said back portion to meet said back portion and enclose said side portions and said top portion therebetween, thereby to from a generally flat parcel.

4,204,517

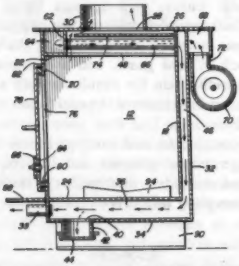
FIREPLACE FURNACE

Joseph N. Rumsey, Rte. 3, Box 327, Wilmington, N.C. 28401

Filed Mar. 30, 1978, Ser. No. 891,729

Int. Cl.[2] F24C *1/14*

U.S. Cl. 126—63 **14 Claims**



1. A heater, said heater defining a firebox including fuel entrance means for allowing introduction of fuel into the firebox, said firebox being defined by front, rear and opposite sides interconnected by a bottom side at their lower ends and by a top side at their upper ends, an outer rear wall extending between the rear marginal portions of said opposite sides rearwardly of said rear side and a bottom wall extending between the lower marginal portions of said opposite sides and between the lower marginal portion of said rear wall and the lower marginal portion of said front side below said bottom side defining a front to rear extending flow passage between said bottom side and bottom wall and downwardly extending flow passage between said rear side and rear wall, the interior of said firebox including hollow upper opposite side rear to front extending side manifolds and an upper front transverse manifold extending between and communicated with the forward ends of said side manifolds, said top side having a flue outlet therein, and a plurality of front to rear extending tubular heating air flow tubes extending between and communicating with said front transverse manifold at their front ends and the upper portion of said downwardly extending flow passage at their rear ends, and means operative to pump air under pressure into the rear ends of said side manifolds, the front to rear extending passage including opening means at its forward end opening through the lower marginal portion of said front side.

4,204,518

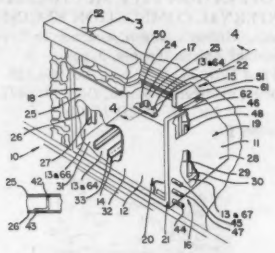
WOOD BURNING HEATING UNIT

James H. Smith, R.D. 1, Box 789, Mohnton, Pa. 19540, assignor to James Howard Smith, Mohnton, Pa.

Filed Jan. 26, 1977, Ser. No. 762,800

Int. Cl.[2] F24B *9/04*

U.S. Cl. 126—132 **1 Claim**



1. A wood burning heating unit comprising

(a) walls defining a combustion chamber and having wall cavities therein for heating a liquid,

(b) a floor beneath said combustion chamber and having a floor cavity therein for heating a liquid,

(c) baffle means separating a portion of said floor cavity into separate floor passageways, said floor passageways having a direction from the front of said floor adjacent the fireplace opening towards said rear wall,

(d) baffle means separating a portion of said wall cavities into separate substantially vertical wall passageways, and

(e) a heat absorption unit formed of spaced tubes positioned above the combustion chamber, said tubes connected in groups by cavities in header units at each end to provide a continuous path from a top portion of said wall to an exit from said heating unit

whereby said liquid flow path to progressively heat said liquid includes

(i) inlet flow generally into the front of said floor cavity,

(ii) then flow from the front of said floor cavity rearward through said floor passageways,

(iii) then flow vertically up the walls through said wall passageways,

(iv) then flow around the periphery of the top of said wall cavities into said heat absorption unit inlet,

(v) then flow through said path formed by said groups of tubes and header units cavities thereby multiply reversing the flow direction across said heat absorption unit, and

(vi) then flow from said heat absorption unit generally into an outlet standpipe to exit said heating unit.

4,204,519

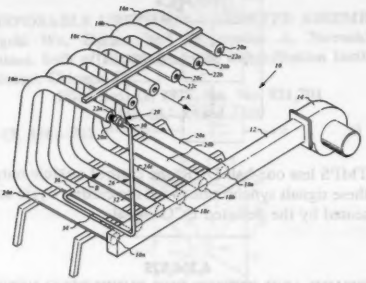
FORCED HOT AIR FIREPLACE ATTACHMENT

Mark W. Towery, 5750 Sheridan Dr., Williamsville, N.Y. 14221

Filed Jul. 24, 1978, Ser. No. 905,479

Int. Cl.[2] F23H *13/00*

U.S. Cl. 126—164 **1 Claim**



1. In a forced hot air heat exchanger for woodburning fireplaces having a blower connected to a header and a plurality of heat exchange tubes each having one end in communication with the header and the other end of each having an opening facing away from the fireplace and toward a space to be heated for directing air thereto; the improvement, comprising;

conduit means in communication with at least one of the openings for directing air therefrom into the fireplace, said conduit means comprising;

an upper horizontal section having removable coupling means connecting to at least one of the openings,

a vertical section connected to said upper horizontal section substantially in the plane thereof;

a lower horizontal section connected to said vertical section, and an outlet horizontal section connected to said lower horizontal section generally perpendicular thereto and substantially out of the plane thereof for discharging air into the fireplace in a direction that is generally perpendicular to the facing direction of the openings.

4,204,520

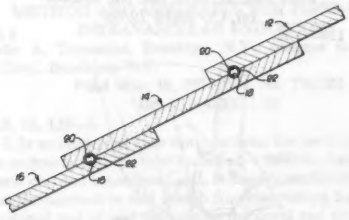
ROOF COMPRISING ROOFING TILES WITH SOLAR WATER HEATING SYSTEM THEREIN

David Rosenberg, 865 Comstock Ave., Los Angeles, Calif. 90024

Filed Mar. 2, 1978, Ser. No. 882,784

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—432 **9 Claims**



1. A flat roofing tile having upper and lower ends and flat upper and lower surfaces for positioning between corresponding overlying and underlying flat tiles in engagement with the flat lower and upper surfaces thereof, respectively, a transverse groove of substantially semicircular cross section in its upper surface adjacent and spaced from its upper end, and a transverse groove of substantially semicircular cross section in its lower surface adjacent and spaced from its lower end, with said grooves mating with corresponding grooves in said corresponding overlying and underlying tiles whereby the tiles when placed in an over and underlying relationship said mating grooves encircle a fluid conducting heat transfer tube.

5. In a roof having a solar water heating system therein, the combination of:

(a) a plurality of generally rectangular roofing tiles having flat overlapping upper and lower surfaces provided with registering transverse grooves of substantially semicircular cross section in said flat overlapping surfaces, with grooves of overlapping tiles facing each other defining substantially circular passages; and

(b) thermally conductive tubes in said registering grooves said tubes conducting a heat transfer fluid.

4,204,521

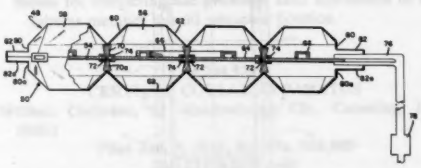
SOLAR ENERGY TRACKING COLLECTOR

John P. Mattson, Duxbury, Mass., assignor to Solarspan, Inc., Duxbury, Mass.

Continuation-in-part of Ser. No. 649,032, Jan. 14, 1976, Pat. No. 4,077,393. This application Jun. 12, 1978, Ser. No. 914,388

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—446 **6 Claims**



1. A solar energy collector comprising: a cover member having a multiplicity of raised surfaces transmissive to solar energy having certain surfaces forming a plurality of tiers of surfaces each arranged with respect to angle and direction to collect solar radiation by direct and reflected transmission as the angle of maximum insolation varies and having a plurality of support members, a base member having a plurality of support members in register with said cover support members for holding said cover member and base member in spaced relationship, a solar energy receiving means disposed between said cover and base members, high temperature resistant thermally insulating means disposed between said support members and said solar energy receiving means, a fluid flow heat exchanger in thermal contact with said solar energy receiving means for conveying collected energy away from said solar energy receiving means.

4,204,522

SOLAR HEATERS

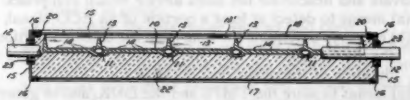
William J. Wilson, 136 Cockburn St., Masterton, New Zealand

Filed Aug. 25, 1977, Ser. No. 827,544

Claims priority, application New Zealand, Aug. 25, 1976, 181854

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—447 **17 Claims**



1. A heat exchanger for a solar heater comprising:

at least two pipes embedded within a one piece panel and upstanding walls of truncated triangular-shaped cross section extending from the surface of the panel, which

said panel surface in use as the heat exchanger in a solar heater is the surface adapted to absorb solar radiation, said upstanding walls being integral with the panel and so positioned that a grid-like pattern of intersecting walls at right angle to one another is formed over the absorbing surface of the panel, the said walls which extend across the panel in one direction, except for those at the edge of the panel, being located above a said pipes and at least one of the upstanding walls which are at right angles to the walls extending in said one direction being of a height above the said absorbing surface greater than the remaining walls.

4,204,523

MOUNT FOR SOLAR COLLECTORS

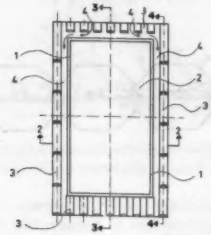
Eva Rothe, Bamberg, Fed. Rep. of Germany, assignor to E. Cacarda GmbH, Bamberg, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,763

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641073

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—450 **10 Claims**



1. A support for mounting solar energy collectors upon the roof rafters or laths of a roof of a building, said support being matingly receivable in an opening in the roof covering material, comprising:

a shell having a generally flat, rectangular base and an upstanding edge secured to, and extending about the entire periphery of said base; and

a frame secured to, and extending about, the entire periphery of said shell, generally normally to said upstanding edge and spaced below the uppermost portion of said edge, said frame being configured and dimensioned to correspond to the outer surface shape of the roof covering material and to permit mating receipt thereof in said opening of said roof covering material.

4,204,524

METHOD AND APPARATUS FOR CONTROLLING CARDIAC ASSIST DEVICE

Peter J. Martin, 52A Pomfret Rd., Narragansett, R.I. 02882, and Dov Jaron, 66 White Horn Dr., Kingston, R.I. 02881

Filed Nov. 7, 1977, Ser. No. 849,133

Int. Cl.[2] A61H *31/00*

U.S. Cl. 128—1 D **13 Claims**

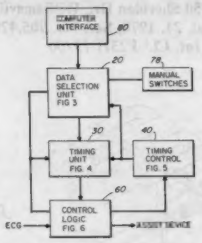
1. An apparatus to control a cardiac assist device which apparatus is responsive to an ECG signal and is adapted to activate and deactivate the assist device which comprises:

(a) means to detect at least a portion of an ECG signal;

(b) means to determine the time from the detected portion of the ECG signal to mid pump systole (TMPS) and the duration of the pump systole (DUR);

(c) means to store the TMPS and the DUR, and to generate values based on the TMPS plus or minus one-half DUR, the means to store in communication with the means to determine; and,

(d) a control module in communication with the means to detect and the means to store, the control module adapted to output signals to the assist device which signals control the time of activation and deactivation of the assist device, the signals output based on TMPS plus one-half DUR and



TMPS less one-half DUR; the control module outputting these signals synchronous with the cardiac cycle as represented by the detected ECG signal.

4,204,525

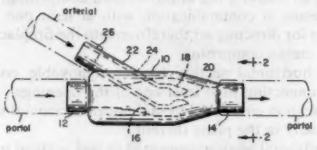
METHOD AND DEVICE FOR SUPPLYING VENOUS PRESSURE IN A PORTAL VEIN

Edward A. Olson, 107 Plymouth Mobile Estates, Plymouth, Mass. 02360

Filed Jul. 14, 1978, Ser. No. 924,615

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**



1. The method of supplying venous blood to the liver at a pressure in excess of the back pressure tending to prevent delivery thereof by the portal vein thereto comprising introducing arterial blood to the flow path of the venous blood in the portal vein adjacent to the liver.

4,204,526

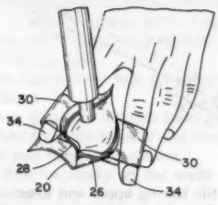
ARTERIAL GRAFT AND PACKAGE

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest Wood, 2465 Ivanhoe Dr., Los Angeles, Calif. 90039

Filed Aug. 31, 1978, Ser. No. 938,446

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **5 Claims**



1. An arterial graft forming package comprising an elongate graft forming porous base member and an elongate bag containing the graft forming base member therein, said bag being formed of a fluid impervious, flexible plastic which is inert to blood and sealed all around except for an access opening at one

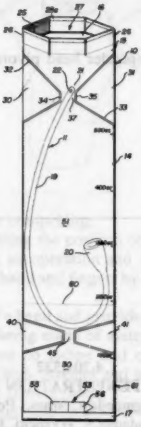
end, sealing means adjacent the open end capable of relative lateral movement between closed sealing connection and open position, finger loops secured to the opposite outer walls of the bag adjacent the open end to enable the insertion of fingers of one hand for finger engagement to apply force in the direction away from each other for disengagement of the sealing connection and for holding the end of the bag in open position with one hand, leaving the other hand free.

4,204,527

DISPOSABLE URETHRAL CATHETER ASSEMBLY

Yeongchi Wu, Darien, and Christopher A. Nowacki, Des Plaines, both of Ill., assignors to Rehabilitation Institute of Chicago, Chicago, Ill.

Filed Sep. 12, 1977, Ser. No. 831,701
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—762 **23 Claims**



1. A fluid collector comprising a urethra catheter for delivering a quantity of liquid from a human body, and a flexible bag containing the catheter prior to catheter use, the bag including first barrier means defining at least a first chamber capable of containing a predetermined volume of liquid and a second chamber capable of containing the liquid delivered from the body in excess of the liquid deposited in the first chamber, the collector further including a cannula plug member for fully sealing the first chamber from the second chamber after the first chamber has been filled.

4,204,528

METHOD AND APPARATUS FOR FIBER-OPTIC INTRAVASCULAR ENDOSCOPY

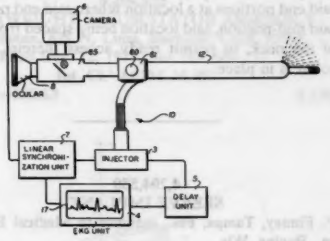
Zafer A. Termanini, Brooklyn, N.Y., assignor to Zafmedico Corp., Brooklyn, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,302
Int. Cl.[2] A61B *1/06*
U.S. Cl. 128—6 **22 Claims**

1. In an improved fiber-optic catheter for use in cardiovascular endoscopy of the type including a flexible sheath having a distal end and a proximal end, at least one afferent fiber-optic bundle disposed in said sheath for transmitting light from the proximal end of said catheter to the distal end thereof, and at least one efferent fiber-optic bundle disposed in said sheath for returning light from said distal end to said proximal end, the improvement comprising:

said catheter sheath having a longitudinally extending lumen therein and a rounded distal end face;

a tubular member having a distal portion, said distal portion having at least one aperture therein, said tubular member being mounted in said lumen for longitudinal sliding movement between a retracted position in which at least a major portion of said distal portion is received within said lumen and a position in which the free end of the distal portion of said tubular member is extended axially outward from the distal end face of said sheath, the free end of said distal portion being rounded, said rounded sheath



end face and said rounded distal portion free end being shaped such that when said tubular member is in said retracted position said sheath and said distal portion free end define a uniformly curved surface; and

means for restricting the proximal axial movement of said tubular member to said retracted position.

4,204,529

CERVICAL COLLAR APPARATUS

William Cochrane, 64 Meadowbrook Cir., Cumming, Iowa 50061

Filed Jan. 3, 1978, Ser. No. 866,805
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **8 Claims**

1. A cervical collar apparatus comprising:

means adapted to underlie at least the head and trunk of the body of a patient for rigidly supporting a patient;

said support means comprising a head supporting portion and a trunk supporting portion;

an elongated, elastically deformable core;

said core having a mid-portion comprising means for contiguously encircling a patient's neck while leaving the front portion of the neck uncovered when said cervical collar is in place;

said core having a pair of end portions each integral with said mid-portion and extending forwardly from said mid-portion at the front of a patient's neck when said cervical collar is in place;

an elongated, flexible cover around said core;

said cover having a pair of end parts each extending longitudinally beyond a respective end portion of the core;

said trunk supporting portion of said support means having means for connecting each of said end parts thereto;

said end parts comprising first tie means for releasably securing each of said end parts to said connecting means and for securing the trunk portion to said support means and for longitudinally lengthening said end portions of said collar

when said collar is in place to provide mild cervical traction;

means for preventing the longitudinal movement of said cover relative to said core;

second tie means secured to said cover at a location on said core where one of the end portions is integral with the mid-portion of the core; and,

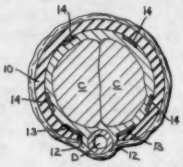
said second tie means comprising means for tieing together said end portions at a location where said end portions join said mid-portion, said location being spaced from the front of the neck, to permit ready access thereto, when said collar is in place.

4,204,530

SLEEVE IMPLANT

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corp., Racine, Wis.

Filed Mar. 29, 1979, Ser. No. 25,016
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—79 **10 Claims**



1. An implantable sleeve for increasing the diameter of a penis includes:

(a) a soft, flexible sheet which can be formed into the shape of an elongated partial cylinder having a crescent-like cross section, said sheet having side edges which are tapered;

(b) suturing strips attached to the wall of the sleeve that forms the inner wall of the cylinder, said suturing strips being located adjacent the tapered side edges of the sheet; and

(c) porous patches located on the same wall of the sheet as the strips, said patches being located on the area of the wall intermediate the side edges.

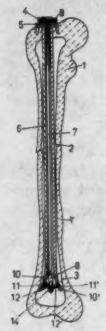
4,204,531

INTRAMEDULLARY NAIL WITH EXPANDING MECHANISM

Yacov Aginsky, 18 Rachel St., Haifa, Israel

Filed Dec. 19, 1978, Ser. No. 970,830
Claims priority, application Israel, Dec. 28, 1977, 53703
Int. Cl.[2] A61B *17/18;* A61F *5/04*
U.S. Cl. 128—92 BC **11 Claims**

1. An expanding mechanism of an intramedullary nail, the latter containing a tubular outer sheath and a rod-shaped element movable in said sheath in longitudinal direction, the expanding mechanism having a front portion to be driven head first into the cavity of a fractured bone and a rear portion forming a continuation of the said outer sheath and said rod-shaped element, the mechanism comprising an expansible element in the shape of at least two longitudinal spreadable branches formed out of the front end of said tubular sheath and at least two longitudinal links, each link being pivotally connected at its rear end to one of said branches at a point close to the front end of said branch, and being pivotally connected at



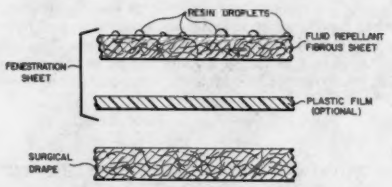
its front end to an expander head pivoted at the front of said rod-shaped element.

4,204,532

NON-SKID FENESTRATION MATERIAL

Herbert C. Lind, Longmeadow, Mass.; Peter J. Rumore, Warehouse Point, and Tadeusz S. Wysocki, Enfield, both of Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Oct. 11, 1977, Ser. No. 841,029
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 D **9 Claims**



1. A non-skid fenestration sheet material for attachment to a disposable surgical drape having a fenestration comprising a flexible, light weight, fluid repellent, fibrous web having an inner planar surface for overlying the surgical drape in confronting relationship thereto and for being firmly secured to the surgical drape and an exposed abrasion-resistant non-skid outer surface comprised essentially of a random array of discrete resin droplet particles forming a discontinuous layer covering more than 2% and less than 10% of the total planar surface area of said exposed outer surface, said particles having exposed surfaces characteristic of droplets and an average particle size of less than 1000 microns, said resin particles being of intermediate film stiffness and effective to frictionally resist sliding movement of instruments and the like resting thereon even when said outer surface is inclined at an angle greater than 40° to a horizontal plane.

4,204,533

SURGICAL PLATE FOR HOLDING THE HAND AND THE FINGERS DURING HAND AND FINGER OPERATIONS

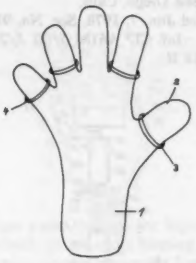
George Forster, Schlossmuhlendamm 8-10, 2100 Hamburg 90, and Herbert Von Wettstein, Hammer Str. 38b, 2000 Hamburg 70, both of Fed. Rep. of Germany

Continuation of Ser. No. 777,702, Mar. 15, 1977, abandoned. This application Aug. 21, 1978, Ser. No. 935,645

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 7610104[U]

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—133 1 Claim



1. A surgical element comprising:

means for fixedly holding the position of a hand and fingers of a patient during an operation and yet permitting easy accessibility to the hand and fingers by the surgeon including;

a plate in the shape of a hand and provided with spread-apart fingers, said plate being made of material means which is particularly resistant to iodine and chromium halogens and also can bear high thermal and mechanical loads to permit sterilization thereof; and

elastic, removable rings positionable over all but one of the fingers of the patient and over the corresponding ones of said fingers of the plate.

4,204,534

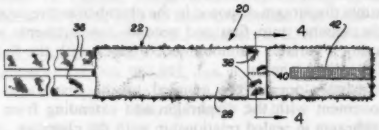
LIMB AND/OR BODY RESTRAINT

Dennis J. Leary, 3104 Bagley Ave., Los Angeles, Calif. 90034

Filed Dec. 18, 1978, Ser. No. 970,203

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—134 6 Claims



1. A limb and/or body restraint device comprising:

an elongated band defining a main body member, said body member including a first inner surface of soft pliable material arranged for direct contact with the skin surface of a patient, and a second outer surface of soft pliable material attached to one side of said first inner sheet;

securing means attached to said inner and outer surfaces to secure said band in a wrapped mode;

attaching means secured to one end of said band to attach said band to a fixed structure so as to restrain movement of said patient, wherein said attaching means comprises a pair of elongated strap members extending longitudinally outward from one end of said band; and

a keeper means attached to said band and disposed transversely across said outer surface to keep said attaching means in a fixed relationship to said band when in a wrapped mode,

wherein said keeper means comprises a strap-keeper member attached at its opposite end to said band wherein two loop members are defined by affixing the central portion of said keeper member to said outer surface.

4,204,535

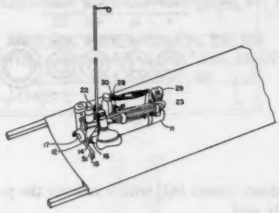
LIGHTWEIGHT RESUSCITATOR ASSEMBLY

Charles Pohlmann, 621 N. Lima, Burbank, Calif. 91505

Filed Dec. 12, 1977, Ser. No. 859,277

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—202.13 6 Claims



1. A resuscitator assembly comprising:

an oxygen cylinder of a first or second size;

a frame member fastenable to said cylinder, said member extending along a substantial portion of the length of said cylinder;

fastening means securing said frame to said cylinder;

a regulator mounted on said frame and coupled to said oxygen cylinder for accepting high pressure oxygen from said cylinder and for providing a regulated supply of pressure oxygen;

a high pressure gauge mounted on and communicating with the high pressure side of said regulator to show the cylinder internal pressure;

a respirator and flow control valve therefor;

hose means coupling said flow control valve to the low pressure side of said regulator;

a venturi chamber including a partial vacuum outlet connected to said regulator and driven by the regulated oxygen supply for producing a partial vacuum;

aspirator means coupled to the partial vacuum outlet of said venturi chamber;

means storing on said frame said respirator and demand valves, aspirator means and interconnecting hoses therefor; and

further comprising an elongated handle attached to and extending along said frame, said handle being long enough to extend over the two center of gravity produced by either size of oxygen cylinder to provide a convenient carrying point for the resuscitator assembly when equipped with either size cylinder.

4,204,536

RESPIRATOR

Scato Albarda, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1978, Ser. No. 911,212

Claims priority, application Netherlands, Jun. 30, 1977, 7707259

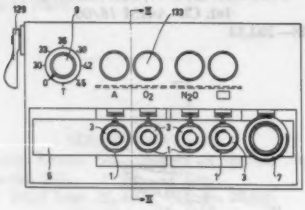
Int. Cl.[2] B61D *27/00*

U.S. Cl. 128—204.22 3 Claims

1. A respirator for administering a gas mixture of predetermined composition to a patient at a predetermined flow rate, comprising at least one controller for controlling a gas flow which is controlled by an electric control member and which

comprises a gas passage provided with a displaceable closing member, wherein:

the controller (1) comprises a valve having a closing member including a ball (13) which closes the gas passage (11) in one position and which is displaceable, by a pin (15) which is displaceable in a longitudinal direction by a drive system (29), to gradually open the gas passage (11), a defined relationship existing between gas flow through the valve (1), differential gas pressure across both sides of the gas passage (11), and the position of the ball (13); and further comprising



position sensor means (43) which indicate the position of the ball (13); and

pressure sensor means which measure (19) said differential pressure;

the control member functioning to displace the ball (13), using the drive system (29), on the basis of the differential pressure, the position of the ball (13) and an adjusted desired gas flow, so that the desired gas flow passes through the valve (1) in accordance with said relationship between these quantities.

4,204,537

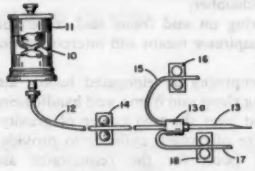
PROCESS FOR PHERESIS PROCEDURE AND DISPOSABLE PLASMA

Allen Latham, Jr., Jamaica Plain, Mass., assignor to Haemonetics Corporation, Braintree, Mass.

Division of Ser. No. 596,148, Jul. 15, 1975, Pat. No. 4,059,108, which is a continuation-in-part of Ser. No. 497,558, Aug. 15, 1974, abandoned. This application Jun. 27, 1977, Ser. No. 810,213

Int. Cl.[2] A61M *5/00*; A61J *1/00*

U.S. Cl. 128—214 R **4 Claims**



1. A blood pheresis process, comprising the steps of:

(a) withdrawing whole blood from a donor through phlebotomy needle means connected to said donor and simultaneously admixing anticoagulant therewith;

(b) introducing the resulting anticoagulated whole blood by way of a fluid conduit system into the bottom of a first reservoir while said reservoir is rotating about an axis of rotation;

(c) rotating said first reservoir at centrifuging speed thereby to separate the plasma in said blood from the red cells;

(d) transferring the resulting separated plasma to a second reservoir affixed coaxially to said first reservoir and rotating about said axis of rotation therewith;

(e) stopping said rotating so that the red cells settle to the bottom of the first reservoir;

(f) returning said red cells to said donor through said fluid conduit system, the connection between said donor, said fluid conduit system, and said first reservoir being maintained throughout steps (a)–(f); and

(g) separating said second reservoir from said first reservoir in a manner to aseptically seal said plasma within said second reservoir.

4,204,538

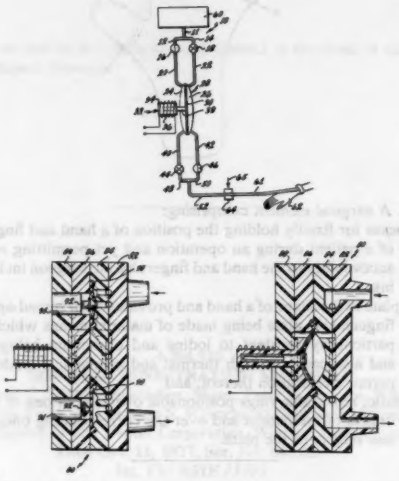
CASSETTE FOR INTRAVENOUS CONTROLLER

Raymond E. Cannon, San Diego, Calif., assignor to IMED Corporation, San Diego, Calif.

Filed Jun. 7, 1978, Ser. No. 913,282

Int. Cl.[2] A61M *5/00, 5/21*

U.S. Cl. 128—214 R **18 Claims**



1. In combination in a cassette for providing for a controlled introduction of fluid from a source to a patient,

a block,

a chamber disposed in the block,

a flexible diaphragm disposed in the chamber and separating this chamber into first and second compartments each having a variable volume in accordance with the flexing of the diaphragm,

a transducer operatively coupled to the diaphragm for movement with the diaphragm and extending from the diaphragm in sealed relationship with the chamber,

an input line in the block for receiving fluid from the source,

an output line in the block for providing for the introduction of fluid to the patient,

a first pair of lines in the block, one of the lines in the first pair providing a communication between the input line and the first compartment and the other one of the lines in the pair providing a communication between the output line and the second compartment, and

a second pair of lines in the block, one of the lines in the second pair providing a communication between the input line and the second compartment and the other one of the lines in the second pair providing a communication between the output line and the first compartment, and

control means disposed in cooperative relationship with the first and second pair of lines for providing alternately for

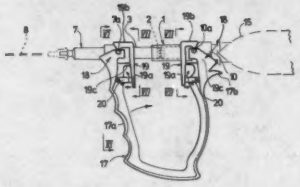
a blocking of the second pair of lines and an opening of the first pair of lines and for providing at other times for a blocking of the first pair of lines and an opening of the second pair of lines.

4,204,539

PUMPS AND SYRINGES

Mathews Van Brugge, 105a Stokes Valley Rd., Stokes Valley, Lower Hutt, New Zealand

Filed Apr. 23, 1979, Ser. No. 32,468
Int. Cl.[2] A61D 7/00
U.S. Cl. 128—223 17 Claims



1. A piston action pump/syringe for liquids comprising a cylindrical tubular body reciprocally housing a piston end of a co-axial plunger which extends outwardly from said body, said plunger and piston end having a common bore through which the body contents can be dispensed and the outlet end of said plunger having a one way valving means including a movable sleeve or skirt part located about said outlet end and an outlet thereof so as to permit egress only of said body contents, and the end part of the body remote from the plunger being provided with one way valving means for ingress only of liquid to the body from a supply source, said body valving means including an elongate member loosely housed in an enlarged bore for longitudinal reciprocal movement between a non-sealable small valve opening to the body interior at one end and a valve opening at the opposite end communicating with a liquid supply source and sealable by the respective elongate member end on the body contents' being pressurised by inward movement of the plunger, outward movement of the plunger relative to the body causing suction therewithin to draw the elongate member off the valve opening to the supply source and towards the non-sealable opening and permit liquid from the supply source to by-pass the elongate member into the body.

4,204,540

OSTOMY COMPOSITION

Rudolfo D. Cilento, North Brunswick; Anthony L. La Via; James L. Chen, both of East Brunswick, and John A. Hill, New Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 804,692, Jun. 8, 1977, Pat. No. 4,166,051. This application Apr. 26, 1979, Ser. No. 33,352
Int. Cl.[2] A61F 5/44
U.S. Cl. 128—283 20 Claims

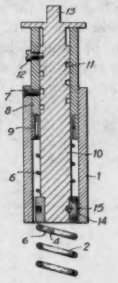
1. The method of protecting the area of skin between the stoma and an attached appliance, faceplate, or skin barrier which comprises shaping and placing around the stoma the shaped mass which comprises a homogeneous mixture of mineral oil and a premix in a ratio of from about 1 to 10 to about 3.5 to 10 on a solids weight basis; wherein said premix comprises a homogeneous mixture of (A) from about 40% to about 60% by weight of a mixture of a pressure sensitive adhesive and an optional elastomer wherein said adhesive is a low molecular weight polyisobutylene and said elastomer if present is a medium molecular weight polyisobutylene or butyl rubber at up to about 30% by weight of said low molecular weight polyisobutylene and (B) from about 40% to about 60% by weight of a second component which is a mixture of one or more hydrocolloid gums, a cohesive strengthening agent, or a mixture of hydrocolloid gums and cohesive strengthening agent wherein said hydrocolloid gums are up to about 40% by weight of guar gum, locust bean gum, or mixtures thereof and from 0% to about 25% by weight of pectin, gum karaya, or mixtures thereof; and wherein said cohesive strengthening agent is finely divided cellulose, finely divided substantially water insoluble crosslinked dextran, finely divided substantially water insoluble sodium carboxymethycellulose, or finely divided substantially water insoluble starch-acrylonitrile graft copolymer.

4,204,541

SURGICAL INSTRUMENT FOR STITCHING UP SOFT TISSUES WITH LENGTHS OF SPIKED SUTURE MATERIAL

Nikolai N. Kapitanov, ulitsa Levchenko, 3, kv. 9, Moscow, U.S.S.R.

Filed Jan. 3, 1978, Ser. No. 866,564
Claims priority, application U.S.S.R., Jan. 24, 1977, 2447214
Int. Cl.[2] A61B 17/04
U.S. Cl. 128—334 R 2 Claims



1. A surgical instrument for suturing soft tissues with lengths of spiked suture material, comprising: a hollow body having an axial bore formed therein; a needle housed within said bore of said body, said needle being movable with respect to said body and having a longitudinal bore formed therethrough adapted to accommodate a length of suture material adapted for introduction along with said needle into the tissue being sutured; a stop fixedly mounted in said bore of said body such that it is stationary with respect thereto, at least a portion of said stop extending within said bore of the needle; said needle and said stop each being shaped as coils having the same mean diameter and lead; said needle being movably mounted in the body such that upon movement of said needle relative to said body to extract the same therefrom, said needle will slide relative to said stop which is fixed with respect to said body whereupon said length of suture material is pushed from within said needle bore by said stop and remain in the tissue being stitched.

4,204,542

MULTISTRAND CARBON COATED SUTURES

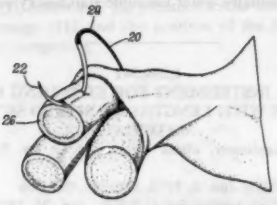
Jack C. Bokros, Alpine; Hong S. Shim, and Axel D. Haubold, both of San Diego, all of Calif., assignors to CarboMedics, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 821,602, Aug. 3, 1977, Pat. No. 4,164,045. This application Nov. 22, 1977, Ser. No. 853,848
The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.
Int. Cl.[2] A61L 17/00
U.S. Cl. 128—335.5 5 Claims

1. A suture assembly for applying a flexible, fatigue resistant and biologically compatible multistrand suture in prolonged or permanent implantation in a living body comprising

a suture needle and connected thereto for surgical suturing procedure,

a fiber substrate array of a plurality of at least about 7 organopolymeric fibers having a tensile modulus of elasticity of about 2×10^6 psi or more, and a fiber diameter of less than about 25 microns, and a dense, adherent, isotropic carbon coating on the fibers having a BAF of about 1.3 or less, a thickness of less than about 7000 Angstroms, and a relatively high tensile fracture strain of at least about 5



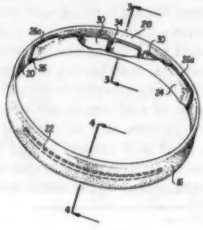
percent, said fibers being individually coated with said carbon coating such that they are free to bend and glide over each other in flexure of the suture, said tensile fracture strain, said tensile modulus of elasticity and said fiber diameter providing the suture with a predetermined high degree of flexibility and strength suitable for implantation by suturing without substantial cracking of said coating along the suture.

4,204,543

COOLANT BAND

Mary M. Henderson, 4401 Tyne Blvd., Nashville, Tenn. 37215

Filed Jan. 6, 1978, Ser. No. 867,582
Int. Cl.² A61F 7/00
U.S. Cl. 128—402 **8 Claims**



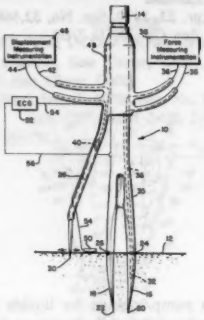
1. A coolant band comprising:
a. an annular strip of textile material having an inwardly presented surface and an outwardly presented surface;
b. coolant means containing a freezable liquid or semi-liquid material;
c. pocket means attached to said inwardly presented surface, said pocket means having enclosed distal ends to insure retention of said coolant means in said pocket and an opening between said ends to enable said coolant means to be inserted and removed from said pocket, and
d. means associated with said strip to maintain said inwardly presented surface and said pocket in direct contractive engagement with a part of the anatomy to be cooled.

4,204,544

SIMULTANEOUS MUSCLE FORCE AND DISPLACEMENT TRANSDUCER

Cyril Feldstein, Sierra Madre; Gilbert W. Lewis, Arcadia, and Virgil H. Culler, La Canada, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 30, 1977, Ser. No. 838,308
Int. Cl.² A61B 5/04, 5/10
U.S. Cl. 128—642 **8 Claims**



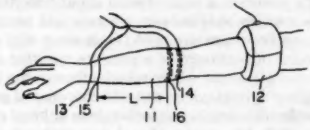
1. A transducer for use with instrumentation for simultaneously measuring muscle force and displacement comprising:
an elongated body slotted at its lower end to form an inverted Y-shaped beam having first and second tines, said tines being tapered into sharp points to facilitate insertion of said tines into muscle, said tines having a low degree of elastic compliance;
a first piezoresistive element bonded to one of said first and second tines, said first piezoresistive element sensing force acting on said beam through said tines for measurement of muscle force in a direction in line with said tines;
a third tine connected to said body, said third tine being tapered into a sharp point at its free end, and said third tine having a high degree of elastic compliance for measuring displacements of said muscle relative to said first and second tines, said third tine being connected to said body in a position to allow the point thereof to pierce said muscle when said first and second tines are inserted into said muscle;
a second small piezoresistive element bonded to said third tine, said second piezoresistive element sensing muscle displacement relative to said first and second tines; and
means for connecting said first piezoresistive element and said second piezoresistive element to said instrumentation.

4,204,545

LIMB BLOOD FLOWMETER

Kenichi Yamakoshi, Tokyo, Japan, assignor to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1978, Ser. No. 898,561
Claims priority, application Japan, Sep. 7, 1977, 52-107441
Int. Cl.² A61B 5/02
U.S. Cl. 128—693 **13 Claims**



1. A limb blood flowmeter comprising:
occluding pressure means for applying pressure to a limb to

be examined on the side of the heart to occlude only the venous return;

admittance measuring means for measuring the admittance of the limb;

means for holding an initial admittance of the limb at the start of measurement;

a subtractor for deriving an admittance change ΔY from the difference tetween the initial admittance and an admittance measured subsequently and operative to produce an electrical signal corresponding to ΔY;

means for setting the value of the blood resistivity ρ of the limb and operative to produce a corresponding electrical signal;

means for setting the value of the length L of the region of the limb to be examined and operative to produce a corresponding electrical signal;

means for setting the value of the tissue volume V_O of the region to be examined and operative to produce a corresponding electrical signal;

a calculator responsive to said electrical signals for calculating $\rho L^2 \Delta Y / V_O$ based on the output ΔY from the subtractor and the blood resistivity ρ, the length L and the volume V_O set in the setting means; and

a controller for controlling the occluding pressure means and the holding of the initial admittance of the limb.

4,204,546

ELECTROENCEPHALOGRAPH

Leland B. Smith, Englewood, Colo., and Phillip J. Loeb, Skokie, Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 9, 1978, Ser. No. 914,061
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—731 **10 Claims**

1. In an EEG system, a plurality of patient electrodes, a differential amplifier having first and second inputs, keyboard means including a plurality of electrode select keys, one for each of said patient electrodes and an averaging key, means controlled by said electrode select keys for developing a first series of digital control signals during successive time periods which recur in repetitive time position frames, first switching means controlled by said first digital control signals for connecting any one of said electrodes to said first input and simultaneously connecting any one of said electrodes to said second input, means controlled by said averaging key for developing a second series of digital control signals corresponding to a predetermined group of said patient electrodes, second switch means controlled by said second digital control signals for connecting all of the electrodes in said predetermined group to a common averaging circuit, and means responsive to depression of one of said electrode select keys after said averaging key has been depressed for deleting the corresponding patient electrode from said predetermined group.

4,204,547

METHOD AND APPARATUS FOR NONINVASIVE MONITORING OF INTRACRANIAL PRESSURE

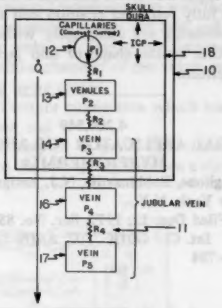
John A. Allocca, 2439 Young Ave., Bronx, N.Y. 10469

Filed Nov. 13, 1978, Ser. No. 959,458
Int. Cl.[2] A61B *5/05*
U.S. Cl. 128—748 **21 Claims**

1. A method for obtaining from mammals a representation of the pressure of cerebrospinal fluid within the cranium, comprising the steps of:

occluding the jugular vein at a selected location outside the cranium to interrupt the flow of blood therethrough; and

determining a value corresponding to the rate of change of blood pressure within the jugular vein upstream of said



location over a predetermined period of time following occlusion thereof.

4,204,548

SOUND FOR INSERTION IN THE BODY FOR THE DETERMINATION OF THE INTERNAL MEASUREMENTS OF HOLLOW ORGANS

Karl H. Kurz, Rheinbabenstrasse 5, Ecke Weissenbrugstrasse, 4000 Dusseldorf, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,972
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756427; Dec. 17, 1977, 7738597[U]
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—778 **9 Claims**

1. A sound for the determination of the internal measurements of hollow organs and hollow parts of the body such as in humans, said sound comprising a longitudinal sound member having a head portion at one end thereof and a foot portion at the opposite end thereof, two rod shaped spring elements of generally uniform thickness disposed at said head portion, said spring elements being attached to said sound member at one end of said spring elements with the other end of said spring elements being unattached, a thread connected between said spring elements, tensioning means acting against said thread to resist said unattached ends of said spring elements spreading apart and to permit said unattached ends to spread apart in one plane upon release of tension therefrom, said sound member guiding said thread to the base of said spring elements, indicating means associated with said thread for indicating the actual distance between said unattached ends of said spring elements

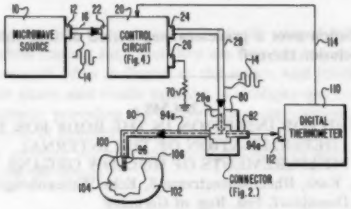
in accordance with the relative shift between said sound member and said thread, said sound member and said spring elements being slidably mounted in a jacket, and said jacket being of sufficient length that when said sound member is telescoped therein to its fully retracted position said sound member and said spring elements are completely within said jacket and thereby conform to the shape of said jacket without being exposed therefrom.

4,204,549

COAXIAL APPLICATOR FOR MICROWAVE HYPERTHERMIA

Robert W. Paglione, Robbinsville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,856
Int. Cl.[2] G01K *7/02*; A61N *5/02*
U.S. Cl. 128—784 **9 Claims**



1. Apparatus for hyperthermia treatment by irradiation of tissue with microwave energy comprising:

a. source means for providing microwave signals;

b. radiator means including a hollow radiating probe responsive to said microwave signals for irradiating said tissue with microwave energy;

c. coaxial means for coupling said microwave signals to said radiator means,

said coaxial means including a coaxial cable having a hollow center conductor and dielectic material between said center conductor and an outer cylindrical conductor, said coaxial center conductor being connected to said hollow radiating probe;

d. thermocouple means including a thermocouple positioned within said hollow radiating probe and further including a pair of wires coupled to said thermocouple and extending through said hollow probe and said hollow conductor of said coaxial cable for providing electrical signals indicative of the temperature of said irradiated tissue; and

e. control means responsive to said electrical signals for coupling said microwave signals to said radiator means when the temperature of said irradiated tissue is less than a predetermined temperature.

4,204,550

APPARATUS FOR FRACTIONATION OF A STANDARD PUFF OF SMOKE FROM A SMOKING MACHINE

Richard H. Newman, Richmond; William L. Jones, Jr., Mechanicsville, and Robert W. Jenkins, Jr., Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 7, 1979, Ser. No. 17,989
Int. Cl.[2] A24F *13/00*
U.S. Cl. 131—171 R **5 Claims**

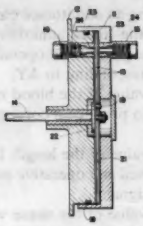
1. For use with an automatic smoking machine for testsmoking cigarettes or the like, a filter holder and support comprising:

(a) a male filter holder portion having a flat circular surface,

(b) a female filter holder portion having a flat circular surface and a peripheral wall capable of fitting removably over said male portion,

(c) a rotatable shaft and hub fitted by means of a bushing in a central opening in one of said holder portions,

(d) a tubular suction port attached to one of said filter holder portions at an opening distinct from said central opening and positioned in its flat surface at a distance from the circular center,



(e) a tubular cigaret mouthpiece attached to the other of said filter holder portions at an opening distinct from said central opening and at a distance from the circular center equal to that of the suction port, and

(f) two filter support pads of flat circular configuration, each having at least one arcuate opening at a distance from the center equal to that of the suction port, and being removably attached to said rotatable shaft and hub.

4,204,551

SMOKING PIPE ACCESSORY FOR AUTOMOBILE GEARSHIFT LEVER

Roger A. Robinson, 407 SW. 11th, Portland, Oreg. 97205

Filed Jul. 13, 1978, Ser. No. 924,372
Int. Cl.[2] A24F *3/00*
U.S. Cl. 131—178 **10 Claims**

1. A pipe for smoking tobacco and the like, comprising:

(a) a main body member having a cavity and a lower cavity therein defined;

(b) attachment means for attaching said main body to an automobile, said attachment means comprising a tubular metal socket arranged to fit tightly within said lower cavity and having a closed upper end, tubular plastic adaptor means for fitting within said socket for engaging a threaded portion of an automobile gearshift control lever, and set screw means located in said socket for securing said adaptor means therein for resisting rotation of said socket about said gearshift control lever;

(c) removable cartridge means located within said cavity for containing tobacco, said cartridge means having an outlet orifice for allowing smoke to pass from the interior of said cartridge means into said cavity;

(d) cover means associated with said main body for concealing said cartridge when it is located within said cavity; and

(e) smoke tube means for transmitting smoke away from said cavity.

4,204,552

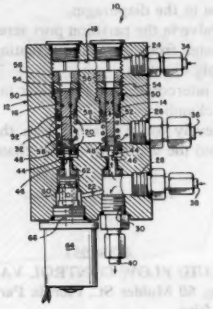
DUAL SPEED FLUID CONTROL APPARATUS

John P. Bott, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1978, Ser. No. 954,263

Int. Cl.[2] G05D *16/00*

U.S. Cl. 137—81 A **13 Claims**



1. A dual speed fluid control apparatus comprising:

a valve body;

a high pressure passageway and a low pressure passageway extending vertically through the valve body in a spaced apart relationship;

a top portion of the passageways being interconnected by a top plenum, a middle portion of the passageways being interconnected by a middle plenum, and a bottom portion of the passageways being interconnected by a bottom plenum;

the valve body having: an ambient pressure inlet into the top plenum, a fluid bypass outlet into the middle plenum, and a pressurized fluid inlet and fluid outlet into the bottom plenum;

valve means located within each passageway and responsive to pressure in the bottom plenum for bypassing fluid from the bottom plenum to the middle plenum;

spring biased means responsive to the ambient pressure in the top plenum and located in each passageway for pushing each bypass valve means toward the closed position against the pressure in the bottom plenum;

the spring bias on the push means in the high pressure passageway being greater than the spring bias on the push means in the low pressure passageway; and

control valve means for selectively opening and closing the bottom portion of the low pressure passageway to the bottom plenum,

whereby the fluid control apparatus supplies high pressure fluid when the control valve means is closed and the fluid control apparatus supplies low pressure fluid when the control valve means is open, both flow rates being varied by the magnitude of ambient pressure in the top plenum.

4,204,553

VALVES

Terence J. Hayward, Thirsk, and Alan H. T. Berrecloth, Yarm, both of England, assignors to HNL Instruments & Controls Limited, Cleveland, England

Filed Jun. 14, 1978, Ser. No. 915,571

Claims priority, application United Kingdom, Jun. 16, 1977, 25256/77

Int. Cl.[2] G05D *16/00*

U.S. Cl. 137—82 **10 Claims**

1. A valve comprising:

an inflow chamber;

a pressure supply connection;

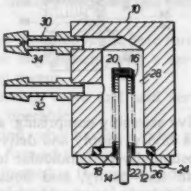
a restrictor leading from the said pressure supply connection to the said inflow chamber;

an outflow chamber in communication with the atmosphere;

a helical spring mounted within the said inflow chamber, with the space within the said spring forming at least part of the said outflow chamber of the valve, and one end of the said spring being closed;

a pressure signal output connection which leads out of the inflow chamber; and

operating means adapted to move said closed end of said spring to move the said spring between a closed condition



in which adjacent coils of the said spring are in contact, and an opened condition in which at least some adjacent coils of the said spring are separated, allowing communication between the inflow chamber and the said outflow chamber, and said spring being so arranged in said inflow chamber that any excess of pressure in the said inflow chamber over that in the said outflow chamber tends to move the spring to its closed condition, whereby any movement of the said spring between its said closed and opened positions is assisted by a positive feedback pressure force.

4,204,554

FLUID CONTROL MEANS

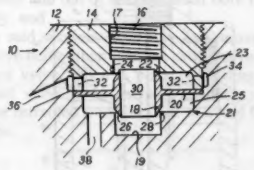
Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 6, 1978, Ser. No. 883,549

Claims priority, application United Kingdom, Mar. 8, 1977, 09624/77

Int. Cl.[2] G05D *11/03*

U.S. Cl. 137—101 **3 Claims**

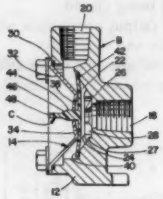


1. A fluid flow divider comprising a generally symmetrical valve member having two seats and being resiliently mounted for movement between outflow passages with which said seats respectively cooperate, a fluid input port connected to the input sides of both valve seats, the resilient mounting means presenting on one side and the other side thereof appreciable respective areas to fluid pressure in the outflow passages downstream of said seats, said valve member being disposed in a body having a bore therein, the inner extremity of which provides one outflow passage and a plug for said bore being arranged to retain means for the resilient mounting of the valve member and provide the other outflow passage.

4,204,555
EXHAUST VALVE ASSEMBLY

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 12, 1978, Ser. No. 914,899
Int. Cl.[2] F16K *11/00*
U.S. Cl. 137—102 **5 Claims**

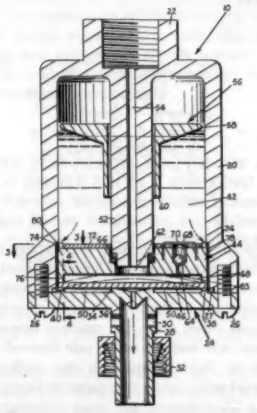


1. An exhaust valve assembly comprising: a housing including a body having a cavity, supply and delivery ports in said body extending substantially perpendicular to one another in communication with said cavity, said housing including a cover secured to said body over said cavity opposite said supply port, a hole in said cover in axial alignment with said supply port, a plurality of openings through said cover outwardly of said hole and defining an exhaust port for said valve, a flexible diaphragm positioned in said cavity between said cover and supply port and having a central integral stem extending through said hole in firm engagement therewith for inhibiting movement of said diaphragm toward and away from said exhaust port and thereby inhibiting horning of said diaphragm, said diaphragm being operative in response to air pressure at said supply port to close said exhaust port and provide communication between said supply and delivery ports, and said diaphragm being responsive to air pressure at said delivery port in the absence of air pressure at said supply port to close said supply port and provide communication between said delivery and exhaust ports.

4,204,556
SELF-CONTAINED, AUTOMATIC PRIMER VALVE FOR SEWER LINE DRAIN TRAPS

Richard N. Sullivan, Portland, Oreg., assignor to Precision Plumbing Products, Inc., Portland, Oreg.

Filed Nov. 29, 1978, Ser. No. 964,630
Int. Cl.[2] F16K *9/00*; F16L *43/00*
U.S. Cl. 137—206 **8 Claims**

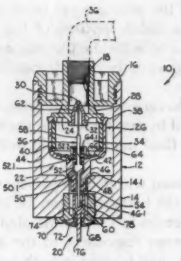


1. A sewer drain trap primer valve comprising:
(a) an upright case having at its upper end a water inlet communicating with the house water line and at its lower end a water outlet communicating with the trap,
(b) a ported partition dividing the case interior into an upper, valve-actuating, trapped air chamber and a lower chamber,
(c) a diaphragm dividing the lower chamber into an upper, water-supplying chamber and a lower, water-dispensing chamber,
(d) a valve seat on the water outlet arranged in valve-forming relation to the diaphragm,
(e) a check valve in the partition port arranged to check the flow of water from the valve-actuating chamber to the water supply chamber,
(f) a conduit interconnecting the water inlet and the water-supplying chamber, and
(g) a passageway for water between the valve-actuating chamber and the water-dispensing chamber.

4,204,557
FLUID FLOW CONTROL VALVE

Edgar P. Scragg, 60 Mulder St., Florida Park Extn. 3, Transvaal, South Africa

Filed Mar. 6, 1978, Ser. No. 883,977
Claims priority, application United Kingdom, Mar. 11, 1977, 10368/77
Int. Cl.[2] E16K *21/06*
U.S. Cl. 137—244 **11 Claims**

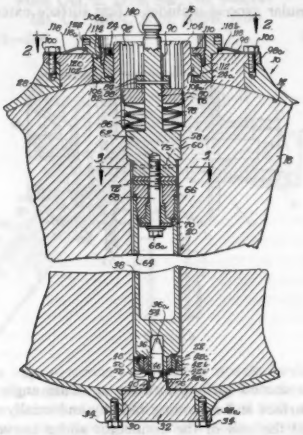


1. A fluid flow control valve comprising a casing, an inlet to the casing, an outlet from the casing, a chamber having a movable wall part and a fixed wall part, a restricted inlet to the chamber through one of said wall parts, said restricted inlet communicating with the inlet to the casing, an elongate cleaning element for clearing dirt and scale from said restricted inlet, an outlet from said chamber, a valve element normally closing said outlet from said chamber, actuating means for displacing both said cleaning element and said valve element whereby said cleaning element moves in said restricted inlet to the chamber and said outlet from the chamber is opened to permit liquid to flow from said chamber and allow said movable wall part to move in the direction which reduces the volume of said chamber, and a valve seat and co-operating valve surface for controlling flow from said inlet of the casing to said outlet of the casing, said seat and surface being arranged to separate upon said movable wall part moving in said direction, wherein the cleaning element is longer than the restricted inlet and is movable between a first position in which it does not extend through the restricted inlet and a second position in which it extends completely through the restricted inlet, and wherein the cleaning element is a rod-like element of self-supporting flexible synthetic plastics material and has a limited inherent rigidity enabling it to force dirt and scale from the restricted inlet.

4,204,558
VALVE ASSEMBLY HAVING REMOTELY REPLACEABLE BEARINGS

Evan R. Johnson, San Diego, and David E. Tanner, Poway, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1978, Ser. No. 869,702
Int. Cl.² F16K *43/00*
U.S. Cl. 137—315 **17 Claims**



1. A valve assembly adapted to be remotely disassembled for servicing of bearings, comprising, in combination, a fluid flow duct defining a flow passage and having an opening intersecting said flow passage, a valve disc disposed within said flow passage and having a diametral bore therethrough defining an axis of rotation, a spindle releasably mounted in said bore and having a first end portion adapted to be rotatably supported, means operatively associated with said flow duct and said first end portion of said spindle for supporting said spindle for rotation about its longitudinal axis, first bearing means carried on said first end portion of said spindle and cooperative with said valve disc, second bearing means, means releasably mounting said second bearing means on said flow duct for cooperative supporting relation with said valve disc, said first and second bearing means supporting said valve disc for rotation about its axis of rotation relative to said flow duct, said spindle having a second end portion accessible through said opening, and means releasably interconnecting said spindle to said valve disc so as to facilitate withdrawal of said spindle and said first bearing means from said valve disc and through said opening without removing said valve disc for servicing said first bearing means, said means releasably mounting said second bearing means being adapted for remote manipulation to facilitate removal of said second bearing means from said flow duct and valve disc for servicing of said second bearing means.

4,204,559
LINE TAP VALVE

Stuart J. Wagner, 19930 NE. 22nd Ct., North Miami Beach, Fla. 33180

Filed Apr. 17, 1978, Ser. No. 897,041
Int. Cl.² F16K *43/00*
U.S. Cl. 137—318 **5 Claims**

1. A line tap valve for tapping refrigerant lines of refrigeration and air conditioning systems, said line tap valve comprising:

(a) a valve housing adapted to be clamped about a refrigeration line,

(b) said valve housing including a first valve body which extends radially of such refrigeration line,

(c) said valve housing including a second valve body which extends radially of the first valve body,

(d) communicating bores formed in said first and second valve bodies,

(e) a line piercing valve mounted in the bore formed in the first valve body for piercing engagement with the refrigeration line, to form a pierced hole therein,

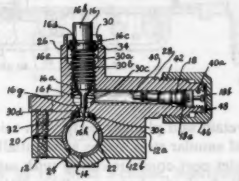
(f) said line piercing valve being adapted to open the pierced hole when backed away therefrom, thereby opening the pierced refrigeration line to said communicating bores, and being adapted to close said pierced hole when reinserted therein, thereby resealing said pierced refrigeration line,

(g) a service valve mounted in the bore formed in the second valve body for engagement with a service hose having valve actuating means,

(h) said line piercing valve and said service valve being independently operable,

(i) said line piercing valve having a valve stem with external screw threads formed thereon,

(j) a valve head formed at the upper end of said valve stem, said valve head having a tool engageable configuration,



(k) a piercing needle provided at the lower end of said valve stem,

(l) the bore in the first valve body having internal screw threads formed therein for engagement with the external screw threads of the valve stem,

(m) whereby the piercing needle is caused to advance or retract relative to the refrigeration line when the line piercing valve is rotated by means of a tool engaging the valve head,

(n) said service valve being removably secured to the second valve body,

(o) said service valve further being provided with external screw threads, and the bore in the second valve body being provided with complementary internal screw threads, whereby the service valve is adapted to be threaded into and out of said threaded bore in the second valve body, and

(p) whereby said service valve may be removed from said second valve body when said line piercing valve is closed, said service valve, when in place, providing flow out of said second valve body thereby enabling said piercing valve to be retracted from said line to avoid flow obstruction therein.

4,204,560
RELIEF VALVE FOR FLUID SYSTEMS

Harald S. Eriksen, Minneapolis, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

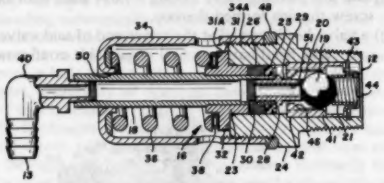
Filed Feb. 16, 1979, Ser. No. 12,645
Int. Cl.² F16K *31/363*
U.S. Cl. 137—508 **4 Claims**

1. Pressure relief valve means for fluid systems and comprising, in combination, a valve housing enclosing a chamber with axially spaced inlet and outlet ports at spaced apart locations within said housing, annular stop means formed within said housing and being disposed between said inlet port and said outlet port, a plunger assembly disposed within said housing

and being adapted for reciprocatory axial motion in first and second directions between normal and bypass operational modes respectively, and a ball-check member received within said plunger assembly and having spring means normally biasing said ball-check into contact with a seat formed in said plunger and disposed between said inlet and said outlet; said pressure relief valve means being characterized in that:

(a) said plunger assembly comprising a generally cylindrical plunger body slidably received within said housing and having seal means disposed about the periphery thereof isolating said inlet and outlet ports from atmosphere, and having conduit means coupling said ball-check seat to said outlet, and said plunger body mounted for reciprocatory motion within said housing and having radially extending shoulder means for engaging said annular stop means for limiting said reciprocatory motion in a first axial direction and positioning said plunger assembly within said housing in a first axial disposition;

(b) first resilient means normally biasing said plunger body toward said first disposition and toward said inlet to normally retain said plunger body with said shoulder means and said annular stop means substantially in engagement;



(c) said inlet port communicating with said ball-check seat, said ball-check member normally isolating the bore of said conduit means from said inlet port when said ball-check member is disposed in said seat; and

(d) ball-check member caging means comprising a spider with a plurality of accurately spaced retaining legs extending radially inward from said housing and forming a stop for said ball-check for limiting movement from said inlet toward said outlet, and for lifting of said ball-check member from contact with said ball-check seat for flow of fluid from said inlet toward said outlet and past said ball-check seat upon predetermined travel of said plunger assembly axially away from said first disposition in said second direction in response to increases in inlet pressure, with said spring means maintaining a biasing force against said ball-check during the travel and positioning of said plunger assembly from said first disposition along said second direction to a second disposition.

4,204,561

FUEL PRESSURE REGULATOR ASSEMBLY

George C. Ludwig, Owosso, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 831,591, Sep. 8, 1977, abandoned. This application Feb. 24, 1978, Ser. No. 880,782

Int. Cl.[2] F16K *31/12*

U.S. Cl. 137—510 **12 Claims**

1. A fuel pressure regulator assembly comprising,

a housing,

a diaphragm separating said housing into a first and second chamber,

said housing having a radial inlet extending to said first chamber,

a connector mounted in said housing and extending axially into said first chamber,

said connector having an axial outlet,

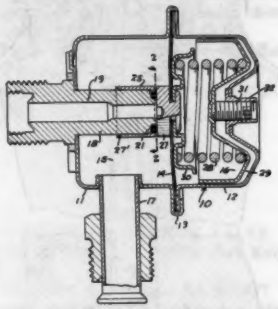
a sealing ring of resilient material,

interengaging means between said sealing ring and said connector for mounting said sealing ring on said connector such that a portion of said sealing ring projects axially beyond said connector,

said interengaging means comprising an annular groove adjacent the inner end of said connector, said sealing ring comprising a ring in said groove and having an axially extending annular convex arcuate surface,

said groove facing radially outwardly, said sealing ring comprising an O-ring positioned in said groove, and a retainer on said end of said connector restricting the radial outward movement of said O-ring,

said annular groove includes a first surface extending radially, a second surface forming an acute angle with said first surface and extending radially and axially outwardly toward the end of the connector and a curved portion connecting said first and second surfaces of said groove, said curved portion having a lesser radius than the cross sectional diameter of the O-ring,



said retainer frictionally engaging the periphery of said connector,

said diaphragm having a valve member adapted to engage said sealing ring,

and spring means in said second chamber urging said valve member against said sealing ring.

4,204,562

TWO-PLY DUCT CORE

Walter F. Kelly, c/o The Wiremold Company, Woodlawn St., West Hartford, Conn. 06110

Filed Apr. 27, 1978, Ser. No. 900,764

Int. Cl.[2] F16L *11/08, 11/16*

U.S. Cl. 138—132 **6 Claims**

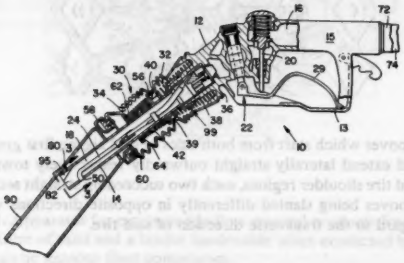
1. Collapsible tubing comprising a first strip of synthetic plastic thin film helically wound into continuous wraps with adjacent edges of adjacent wraps of the first strip secured in edge lapping relation, a helically wound resilient reinforcing element overlying lapping edges of the first strip, and a second strip of synthetic plastic thin film helically wound and tightly secured about the first strip and the reinforcing element, the second strip being wound into continuous wraps with adjacent edges of adjacent wraps of the second strip secured in edge lapping relation, the second strip having lapping edges disposed between adjacent convolutions of the reinforcing element in longitudinally offset relation to the lapping edges of the first strip with the reinforcing element encased between the

first and second strips with the second strip serving as an outer covering.

4,204,563
DISCHARGE SPOUT TIP FOR A LIQUID FUEL-DISPENSING NOZZLE

Walter R. Pyle, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 2, 1978, Ser. No. 948,187
Int. Cl.[2] B67C *3/28*; B65B *3/04*
U.S. Cl. 141—206 **35 Claims**



20. In a vapor-recovery dispensing nozzle having a main body portion, a discharge spout projecting from the main body portion for insertion into a fill pipe of a fuel tank, a fuel flow passage extending through the main body portion and said discharge spout, a tip of said discharge spout having an outlet end proportioned for ease of insertion into the fill pipe, vapor-recovery passage means formed in the main body portion, a vent tube extending through said fuel flow passage to form a primary vent passage having an opening in said discharge spout near the outlet end of said tip, and a release mechanism for automatically preventing the flow of fuel into the fuel tank when the level of fuel in the fuel tank being filled thereby rises above a level sufficient to block the primary vent passage opening, the improvement comprising:

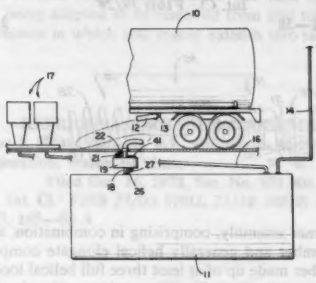
a wedge-shaped projection locatable on the upper surface of said tip inwardly of and adjacent to the outlet end thereof so that one surface of said wedge-shaped projection slopes downwardly from the upper surface of said tip towards the outlet end thereof to form a fuel-deflecting surface for deflecting the flow of fuel through the outlet end of said tip away from the upper surface of the fill pipe, said wedge-shaped projection having an arcuate-shaped larger end for facing towards the outlet end of said tip so that said wedge-shaped projection tapers from wide to narrow in the direction away from the outlet end of said tip, the outer curved portion of said larger end contiguously engaging the inner surface of said tip at the outlet end thereof, and the outlet end of said tip angling inwardly from said wedge-shaped projection to a point outwardly of the vent passage opening in order to provide a generally uniform cross-sectional area for said flow passage extending through said discharge spout.

4,204,564
GASOLINE SPILL PREVENTING APPARATUS

Lawrence H. Balfour, 252 S. Grant Ave., Indianapolis, Ind. 46201

Filed Jun. 5, 1978, Ser. No. 912,528
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—311 A **7 Claims**

2. An anti-spill apparatus for gasoline storage tanks of the type which are filled from the flexible hose of a gasoline transport vehicle, said apparatus comprising an intake pipe adapted to replace the conventional fill pipe on the storage tank, a dump tank adjacent said intake pipe, a first conduit providing communication between the dump tank and the fill pipe and an on-off valve controlling flow through the first conduit, a second conduit connecting a drain aperture in the dump tank to said intake pipe, a check valve interposed in said second conduit permitting flow only from said dump tank to said intake

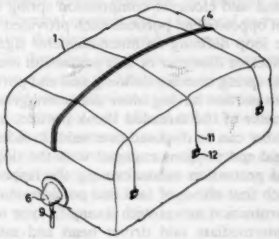


pipe, whereby during filling of the storage tank and with said on-off valve closed the dump tank remains empty but accomodates the gasoline trapped in the hose of the transport vehicle when said on-off valve is opened.

4,204,565
BAG SILO

Ryotaro Nohmura, 19-19, Nishi 3-chome, Senriyama, Suita-shi, Osaka-fu, Japan

Filed Jan. 12, 1979, Ser. No. 3,467
Int. Cl.[2] B65D *81/26*
U.S. Cl. 150—7 **3 Claims**



1. A bag silo for preparing silage from green material, said bag silo comprising:

a bag body, said bag body being comprised of flexible, waterproof material;

an opposed pair of cover flaps extending upwardly from said bag body so as to wholly cover the top opening of the bag when they are closed, said cover flaps being comprised of flexible waterproof material;

fastener means for joining together the edges of said cover flaps, said means forming a weatherproof seal between said edges;

packing means provided on the inside of said cover flaps for making said weatherproof seal substantially airtight;

a juice absorber means disposed at the bottom of said bag and containing a water absorbing material for absorbing the juice from said green material; and

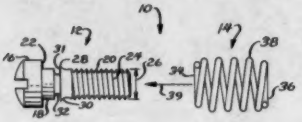
a drainage means disposed at the bottom of said bag, said drainage means being in connection with said juice absorber means.

4,204,566

SCREW AND CAPTIVE COMPRESSION SPRING FASTENER ASSEMBLY

Hall Kirrish, and Jon R. McCauley, both of Rockford, Ill., assignors to Textron Inc., Providence, R.I.

Filed Feb. 10, 1978, Ser. No. 876,550
Int. Cl.[2] F16B *39/24*
U.S. Cl. 151—38 **2 Claims**



1. A fastener assembly, comprising in combination; a screw fastener member and generally helical elongate compression spring member made up of at least three full helical loops, and captively mounted on said fastener member, said spring including oppositely disposed end portions and an intermediate portion extending a substantial distance along the length of said screw fastener member, said screw fastener member including an elongate shank having a driver head formed on one end thereof and including drive tool engagement means, a threaded shank portion including a thread formed therein and having a major thread diameter of a first dimension, and an unthreaded shank portion intermediate said driver head and said threaded shank portion, protrusion means formed on said unthreaded shank portion for maintaining said compression spring member in captive relation on said screw member, said protrusion means including, an annular sloped wall surface facing generally away from said driver head with a major portion of said sloped wall surface having a maximum dimension greater than said major thread diameter, and an abrupt radially disposed wall surface spaced from and facing toward said driver head, said protrusion means wall surface merging to define a crest having an effective diameter larger than said major thread diameter, and said elongate compression spring member having a pair of opposite end portions each provided by a resilient, expandable loop defining an inner diameter significantly less than the effective diameter of said protrusion means, with the loops of said spring member defining said end portions and said intermediate portion having inner diameters greater than said major diameter of the threaded shank portion, such that said spring member can be disposed over said threaded shank with either of said end portions engaged with the sloped wall surface of said protrusion means causing the respective loop to expand, such that either of said end portions can be engaged over said protrusion means with a snap-fit type of action, and disposed intermediate said driver head and said protrusion means, with said abrupt wall surface of said protrusion means maintaining said spring member in captive relation on said fastener member.

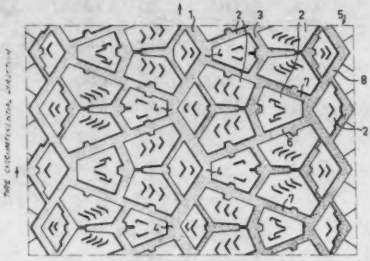
4,204,567

TREAD STRUCTURE FOR PNEUMATIC VEHICLE TIRES

Günter Johannes, and Hans-Dieter Pfeiffer, both of Garbsen, Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,374
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 7717524[U]
Int. Cl.[2] B60C *11/04*
U.S. Cl. 152—209 D **7 Claims**

1. A vehicle tire tread structure for pneumatic tires having a tread and shoulder regions adjacent to said tread, said tread structure comprising in combination a plurality of elevations, a centrally arranged first groove having apexes being provided in said tread and following a zigzag course in the circumferential direction of said tire, said elevations being provided on both sides of said zigzag first groove and following one another in the circumferential direction of said tire, groove means being provided in said tread for separating said elevations from one another, said groove means including second



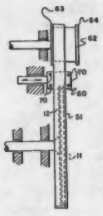
grooves which start from both sides of said zigzag first groove and extend laterally straight outwardly respectively towards said tire shoulder regions, each two succeeding straight second grooves being slanted differently in opposite directions with regard to the transverse direction of said tire.

4,204,568

METHOD OF PROLONGING THE LIFE OF A ROTARY CASTING MACHINE BAND

Yves B. Bonnamour, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 741,829, Nov. 15, 1976, Pat. No. 4,082,136.
This application Feb. 6, 1978, Ser. No. 875,361
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—87 **3 Claims**



1. A method of prolonging the operative life of an imperforate endless metallic band of the type used to close a peripheral groove in a rotating casting wheel of a casting machine adapted to the continuous casting of molten metal, comprising the steps of:

providing an imperforate endless band having a lateral width substantially greater than twice the lateral width of the peripheral groove of the casting wheel; and

contacting the peripheral groove with a first lateral surface area of said band; then

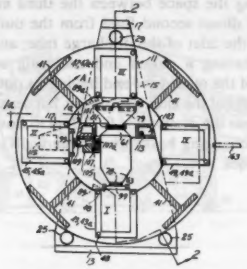
contacting said groove with a substantially different second lateral surface area of said band by laterally shifting sand band and casting wheel relatively of each other by an amount equal to at least the lateral width of said groove,

whereby thermal cracks in said first lateral surface area of said band, caused by prolonged contact of said band with molten metal in said groove, are avoided and subsequent thermal cracks are distributed over a substantial portion of the second lateral surface area of said band.

4,204,569
MULTI-CORE BOX APPARATUS FOR THE MANUFACTURE OF HOLLOW MINERAL PRODUCTS, PARTICULARLY FOUNDRY CORES

Anatol Michelson, 3235 Pine Valley Dr., Sarasota, Fla. 33579

Filed Dec. 28, 1978, Ser. No. 974,102
Int. Cl.[2] B22C *11/06, 15/24*
U.S. Cl. 164—166 19 Claims



1. Apparatus for producing hollow mineral products from a mixture of sand and a binder hardenable when contacted by a catalytic gaseous fluid comprising:

a. a support frame;

b. a housing supported by said frame and rotatable in a vertical plane;

c. means for rotating said housing;

d. a plurality of product forming units mounted to said housing and rotatable therewith;

e. a sand blower mounted centrally of said housing in such a way that said product forming units rotate around said sand blower, said sand blower including a perforated blow plate;

f. means for reciprocating said sand blower relative to a product forming unit therebeneath, thereby bringing said blow plate into engagement with said product forming unit and over an aperture therein;

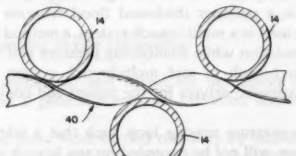
g. a hopper for receiving and holding a quantity of said mixture of sand and binder disposed above said sand blower whereby said mixture gravitates from said hopper into said sand blower; and

h. means for urging said mixture through said blow plate into said product forming unit beneath said sand blower.

4,204,570
HELICAL SPACER FOR HEAT EXCHANGER TUBE BUNDLE

Frantisek L. Eisinger, Demarest, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 23, 1978, Ser. No. 880,399
Int. Cl.[2] F28F *9/00*
U.S. Cl. 165—69 14 Claims

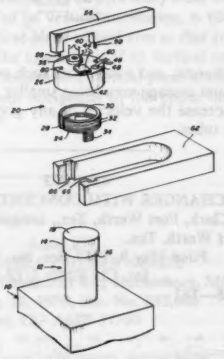


1. A tube spacer for use in a tube bundle including a plurality of spaced apart rows of parallel tube sections comprising an elongated member having a contour defining a helix, said member being adapted to extend at an angle to the longitudinal axes of said tube sections through spaces defined between adjacent tube sections of said rows and to contact the outside surfaces of some of said tube sections, said helix having a pitch proportional to the distance between longitudinal axes of adjacent tube sections contacted by said spacer, said proportion being a function of said angle at which said spacer extends relative to said longitudinal axes of said tube sections, said spacer being adapted to be removed from said tube bundle in the direction in which said spacer extends into said tube bundle.

4,204,571
REFRIGERATOR TESTING ASSEMBLY

Thurber I. Hoyt, Esmond, R.I., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Oct. 16, 1978, Ser. No. 951,806
Int. Cl.[2] F25B *27/00;* H01L *23/34;* H01R *33/00*
U.S. Cl. 165—80 A 10 Claims



1. A refrigerator testing assembly for holding a test transducer in tight thermal contact with a terminal end of a cold tip of a refrigerator the testing assembly comprising:

an externally threaded sleeve for surrounding said cold tip, said sleeve and cold tip having complementary means for holding said sleeve against axial, translational movement toward the terminal end of said cold tip while permitting relative rotary movement; and

an internally threaded transducer supporting cap having an internal axially-facing surface for contacting said cold tip, the cap having material of high thermal conductivity between said internal surface and a test transducer mounted to the cap;

whereby said transducer supporting cap may be moved into tight contact with said cold tip to make thermal contact between said transducer and said cold tip with rotation of said threaded sleeve within said transducer supporting cap.

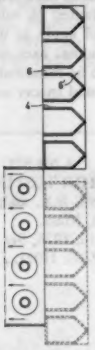
4,204,572
DEVICES FOR CLEANING HEATING BATTERIES

Axel T. Wikström, Falkenberg, Sweden, assignor to AB Scandinavian Energy Saving Co., Halmstad, Sweden

Filed Dec. 21, 1977, Ser. No. 862,844
Claims priority, application Sweden, Feb. 4, 1977, 7701244
Int. Cl.[2] F28G *1/16*
U.S. Cl. 165—95 4 Claims

1. In a device for cleaning a heating battery comprising a multitude of spaced tubes assembled in generally parallel relationship and conducting therethrough a heating fluid for the exchange of heat with a gaseous flow in a transverse direction to said tubes and through the interspaces between adjacent tubes, the provision of flow accelerating channel means having

a relatively larger inlet area and a passage area decreasing to a minimum downstream of said inlet area, said channel means capable of being selectively brought into a position of registering with said tube interspaces upstream of said heating battery



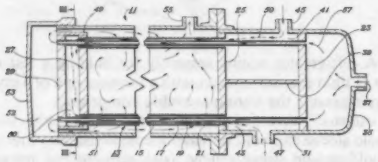
and close thereto, and away from such position, respectively, said minimum passage area being smaller than said interspaces so as to increase the velocity of any given gaseous flow between said tubes.

4,204,573

HEAT EXCHANGER WITH CONCENTRIC FLOW TUBES

David W. Clark, Fort Worth, Tex., assignor to PVI Industries, Inc., Fort Worth, Tex.

Filed May 9, 1977, Ser. No. 795,204
Int. Cl.[2] F28D 7/12
U.S. Cl. 165—142 6 Claims



1. An apparatus for exchanging heat between two fluids comprising:

at least one inner tube spaced concentrically in an outer tube, defining an inner passage and an annular passage;

first manifold means located at the first end of the apparatus for directing all of the incoming first fluid to the inlet of the inner passage; the first manifold means comprising a first partition at the first end of the apparatus having an aperture for sealingly receiving the inlet of the inner tube; and a first housing having a closed end and sealingly secured to the first partition, with an inlet on its closed end for receiving first fluid and directing all of it to the inlet of the inner tube;

second manifold means located at the first end of the apparatus for directing all of the incoming second fluid to the inlet of the annular passage; the second manifold means comprising a second partition spaced from the first partition and having an aperture for sealingly receiving the inlet of the outer tube; and a second housing sealingly enclosing the space between the first and second partitions and having an inlet for receiving second fluid and directing it to the inlet of the outer tube;

third manifold means at the second end of the apparatus for directing discharged second fluid out of the apparatus, including a discharge conduit extending from the second end of the apparatus back to the first end of the apparatus; the third manifold means comprising a third partition at the second end of the apparatus, having an aperture for sealingly receiving the outlet of the inner tube; a fourth partition spaced from the third partition and having an aperture for sealingly receiving the outlet of the outer tube and an aperture for sealingly receiving the inlet of the discharge conduit, the discharge conduit extending through the second partition and discharging second fluid exterior of the housing; and a third housing sealingly enclosing the space between the third and fourth partitions to direct second fluid from the outlet of the outer tube to the inlet of the discharge tube; and

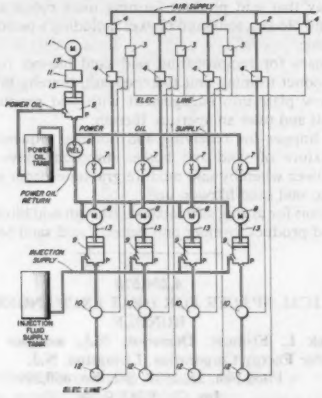
a jacket having a closed end enclosing substantially the length of the outer tube and having an outlet spaced close to the inlet of the annular passage, but separated from it, so as to cause the discharged first fluid to flow over the outer tube, exchanging heat through the walls of the inner and outer tubes.

4,204,574

LOW SHEAR POLYMER INJECTION METHOD WITH RATIO CONTROL BETWEEN WELLS

John L. Stalder, New Orleans, La., assignor to Conoco, Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 835,609, Sep. 22, 1977, abandoned. This application Mar. 21, 1978, Ser. No. 888,728
Int. Cl.[2] E21B 43/22
U.S. Cl. 166—305 R 6 Claims



1. In the injection of shear degradable aqueous polymer solutions in a polymer thickened flood wherein a series of pumps are used in a multi-branch system, a method of reducing shear degradation while maintaining pressure and rate control within any branch of said multi-branch system comprising utilizing hydraulic drivers for the pumps and controlling said drivers

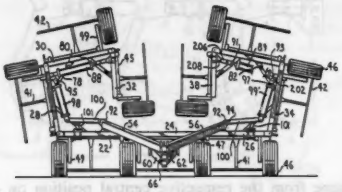
(a) by a pressure sensing loop such that a selected preset pressure will not be exceeded by any branch of the injection system, and

(b) by a rate proportioning control loop whereby the injection rates in the various branches of the multi-branch system will be maintained in a given proportion to one another regardless of rate changes in a designated master branch or in the total injection stream.

4,204,575
METHOD OF FOLDING A PLURALITY OF WING SECTIONS OF AN ARTICULATED IMPLEMENT

Raymond W. Richardson; Robert E. Burda, and John C. Crumrine, all of Cawker City, Kans., assignors to Richardson Manufacturing Company, Inc., Cawker City, Kans.

Division of Ser. No. 717,501, Aug. 24, 1976, Pat. No. 4,133,341.
This application Oct. 27, 1978, Ser. No. 955,334
Int. Cl.[2] A01B 73/00
U.S. Cl. 172—1 4 Claims

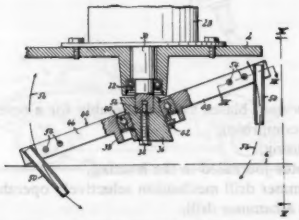


1. A method of folding a plurality of wing frame sections of an articulated implement, said method comprising the steps of:
swinging the outermost section to a folded position;
supporting said outermost section in said position in fixed relationship to the adjoining inboard section;
swinging said outermost and adjoining sections in unison to a folded position of said adjoining section;
automatically interlocking said outermost and adjoining sections as the same are swung in unison to said folded position of the adjoining section; and
continuing to swing said outermost and adjoining sections, support the same on each succeeding inboard section, and automatically interlock each succeeding adjacent pair of sections until said wing frame sections are fully folded.

4,204,576
SOIL AERATING DEVICE

David L. Mullet, Hesston; Raymond J. Rilling, Moundridge, and Elmer D. Voth, Newton, all of Kans., assignors to Excel Industries Inc., Hesston, Kans.

Filed Sep. 20, 1978, Ser. No. 945,699
Int. Cl.[2] A01B 45/02
U.S. Cl. 172—22 10 Claims

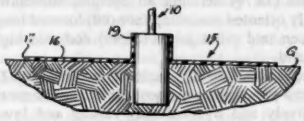


1. A soil aerating device comprising:
a. a frame,
b. means supporting said frame for movement over the ground at a generally constant elevation above ground level,
c. a vertical drive shaft carried rotatably by said frame,
d. power means operable to rotate said drive shaft,
e. an arm freely rotatable about an inclined axis transverse thereto and lying in a vertical plane,
f. a depending tine affixed to each end of said arm, and
g. a drive member interposed between and interconnecting said drive shaft and said arm, said drive member being powered by said drive shaft and operable to impart to said arm a compound movement including a first oscillatory component about a horizontal axis transverse to the midpoint of said arm, whereby each end of said arm oscillates vertically to equal distances above and below horizontal, the tine at each end of said arm being operable to punch a hole in the soil beneath said arm as that end of the arm moves downwardly from horizontal to the lower limit of its vertical oscillation, and a second oscillatory component about the longitudinal axis of said arm, whereby said tines are oscillated between limits disposed equally at opposite sides of the vertical plane of said arm, said first and second oscillatory movements being so synchronized that said tines are disposed in vertical planes when said arm is disposed at the upper and lower limits of its vertical oscillation, and that the tine at each end of said arm is tilted forwardly of the vertical plane of said arm, having reference to the direction of rotation of said drive shaft, as that end of the arm moves from its upper limit of vertical oscillation to horizontal, is tilted again to a vertical plane as that end of the arm moves downwardly from horizontal to the lower limit of its vertical oscillation, is tilted rearwardly of the vertical plane of said arm as that end of the arm returns from the lower limit of its vertical oscillation to horizontal, and returns to a vertical plane as that end of the arm moves from horizontal to the upper limit of its vertical oscillation.

4,204,577
GOLF HOLE CUTTER GUIDE

L. Dalton Bittle, 3208 Jamestown Rd., Hattiesburg, Miss. 39401

Filed Aug. 10, 1978, Ser. No. 932,600
Int. Cl.[2] A63B 57/00
U.S. Cl. 172—25 1 Claim



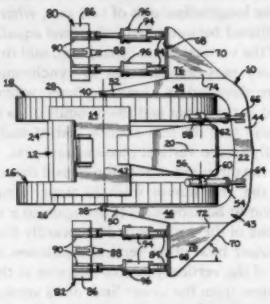
1. Apparatus for positioning a golf cup on a golf green comprising a guide member and a cutter tool, said guide member including a flat generally circular base having an upper surface of a size to support a person thereon, a guide sleeve having a first end integrally connected to said base and extending axially upwardly so that a second end is located at a predetermined height, said guide sleeve having an inner peripheral diameter which is substantially similar to the outer diameter of the golf cup, said cutter tool including an elongated tubular member having first and second ends and an outer diameter which is substantially the same as the diameter of the golf cup, the length of said tubular member being greater than the combined length of said guide sleeve and the golf cup, said tubular member being substantially hollow and unobstructed from said first end to said second end, an elongated rod connected to said second end of said tubular member and extending axially away from the same, a handle fixed to the end of said rod remote from said tubular member, said tubular member being slidably received by said guide sleeve, and said first end of said tubular member caused to penetrate a golf green until said second end of said tubular member is substantially level with said second end of said guide sleeve, whereby a plug of earth may be removed from the green leaving an opening of a size to receive a golf cup and said circular base prevents the formation of a ridge around the opening when the plug is removed.

4,204,578

GROUND-ENGAGING IMPLEMENT ASSEMBLY

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 26, 1978, Ser. No. 909,753
Int. Cl.[2] A01B *13/08, 63/102*
U.S. Cl. 172—307 **3 Claims**



1. A ground-engaging implement assembly (10), for installation on a vehicle (12) having first and second ends (22,24), first and second sides (26,28), and a longitudinal axis (20), comprising:

a pair of transversely aligned pivot joints (38,40) connected to the sides (26,28) of the vehicle (12);

a U-shaped frame (43) having a bight portion (44) and a pair of spaced leg portions (46,48) individually having a distal end (50,52), said bight portion (44) extending around one of said vehicle ends (22,24) and said leg portions (46,48) extending along said sides (26,28) and being connected individually to said pivot joints (38,40) at the distal ends (50,52), each of said leg portions (46,48) having a wing portion (72,74) defining an upright, substantially transversely oriented mounting face (68) located longitudinally between said pivot joints (38,40) and said bight portion (44); and

two mechanisms (80,82), each mechanism (80,82) having a material penetrating element (88) and jack means (96) for selectively and hydraulically raising and lowering said element (88), and each mechanism (80,82) being connected to a respective one of said mounting faces (68) at the opposite sides (26,28) of the vehicle (12).

4,204,579

CULTIVATOR WITH PIVOTAL TINES

Willy Rau, Weilheim, and Christian Taus, Kirchheim, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Rau oHG, Weilheim, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 827,708
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2638438; Jul. 8, 1977, 2730858
Int. Cl.[2] A01B *61/04*
U.S. Cl. 172—657 **28 Claims**

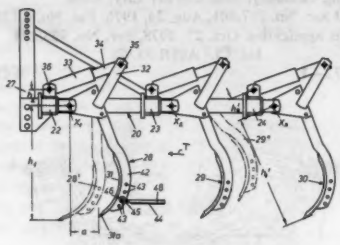
1. An agricultural ground-working apparatus comprising:

a frame displaceable along the ground in a predetermined normal direction of travel;

a plurality of ground-penetrating tools spaced horizontally apart on said frame;

separate mounting means between said frame and each of said tools forming for each of said tools a separate pivot on said frame for pivoting of each tool on said support forwardly and backwardly relative to said direction of travel from a respective normal central position, the separate pivot for each tool being a pivot about which only that one of said plurality of ground-penetrating tools pivots; and

equalizing means including only a plurality of hydraulic cylinder-piston units each operatively connected to a respective one of said tools and fluid-filled conduit means interconnecting said units for pivoting one of said tools forwardly about the separate pivot thereof relative to said



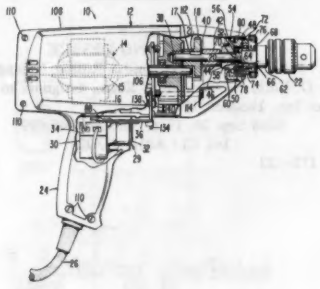
frame from the respective central position on displacement of another of said tools backwardly relative to said frame about the separate pivot thereof from the respective central position.

4,204,580

FORWARD BIASED SWITCH FOR A REVERSIBLE HAMMER DRILL

David J. Nalley, Liberty, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,777
Int. Cl.[2] E02D *7/02;* **B23B** *45/00*
U.S. Cl. 173—48 **4 Claims**



1. A forward biased switch assembly for a reversible hammer drill comprising:

a. a housing,

b. a motor journaled in the housing,

c. a hammer drill mechanism selectively operable as a drill or as a hammer drill,

d. a trigger switch in circuit with the motor to turn the motor on and off,

e. a reversing switch in circuit with the motor and having an actuating button selectively to place switch into the operative positions of forward or reverse,

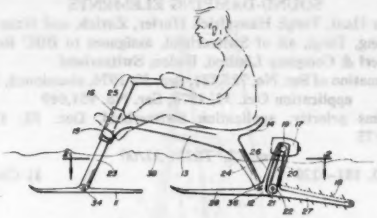
f. a lever pivotally connected to the reversing switch to shift the actuating button between the forward position and the reverse position,

g. a biasing means including a spring connected in the housing to bias the lever and cause it to urge the actuating button continuously in the forward position whereby the operator is free to manually shift the lever to place the actuating button in the reverse position.

4,204,581
SNOWFOIL SKI-BOB

Royce H. Husted, Wheaton, Ill., assignor to Saroy Engineering, Wheaton, Ill.

Filed Jan. 26, 1978, Ser. No. 872,688
Int. Cl.[2] B62B *13/14;* B62M *27/02*
U.S. Cl. 180—190 3 Claims



1. In a power driven snowfoil ski-bob for moving in soft snow, comprising in combination:

a front steerable ski and a rear propulsion unit, each having a limited frontal area and a substantial under surface area,

a frame adapted to support a rider,

a motor for propelling said propulsion unit,

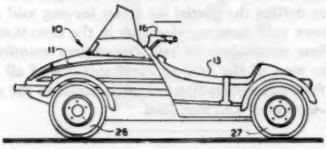
struts for connecting said front ski and said propulsion unit to said motor to other parts of said ski-bob,

the improvement wherein said motor is carried elevated above the propulsion unit and the snow on a strut having a substantially narrower frontal area than said motor so that the drag imposed by the snow on said ski-bob is minimized.

4,204,582
WHEEL CONVERSION KIT FOR SNOW VEHICLE

Gerrit J. van Soest, 555 Yorston St., Williams Lake, British Columbia, Canada (V2G 1H3)

Filed Mar. 31, 1978, Ser. No. 892,336
Claims priority, application United Kingdom, Apr. 5, 1977, 14280/77
Int. Cl.[2] B62M *27/02*
U.S. Cl. 180—183 15 Claims



1. A conversion kit for converting a snow vehicle into a wheeled vehicle, the kit having a front axle assembly for mounting a pair of steerable front wheels and a rear axle assembly for mounting a pair of rear wheels, the kit also having front axle mounting means including at least one axle bracket characterized by:

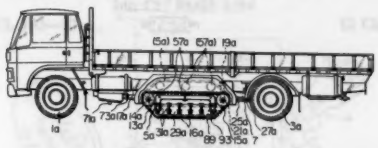
(a) a pair of members spaced apart sufficiently to straddle the front axle assembly and adapted for securing rigidly the front axle assembly to the axle bracket,

(b) securing shaft means extending from the axle bracket and adapted to pass directly through ski pivot openings in a transverse beam adjacent the front of the snow vehicle, and releasable securing means to secure the securing shaft means rigidly to the transverse beam.

4,204,583
WHEELED VEHICLE WITH ROTATABLE ENDLESS TRACK

Hirozumi Toyoura, No. 3285, Izumi, Komae-shi, Tokyo, and Masaharu Saito, No. 42, Myojindai, Hodogaya-ku, Yokohama-shi, Kanagawa-ken, both of Japan

Filed Aug. 8, 1977, Ser. No. 823,044
Claims priority, application Japan, Aug. 8, 1976, 51-094240
Int. Cl.[2] B62D *55/04*
U.S. Cl. 180—9.28 4 Claims



1. A wheeled vehicle having a source of driving power, a chassis extending longitudinally in said vehicle, a propeller shaft connected to the source of driving power, rear wheels drivably connected to the source of driving power through the propeller shaft, and an auxilliary drive means comprising:

a pair of rotatable endless track means disposed between a pair of front and rear wheels;

means for selectively raising and lowering said pair of endless track means with respect to the road surface; and

means for drivably connecting said endless track means with said source of driving power when said endless track means is lowered and brought into contact with the road surface, said connecting means comprising first and second rotatable shafts for driving said pair of endless track means, said first and second shafts extending parallel to the axis of said propeller shaft, first pulley means fixedly mounted on said propeller shaft and rotatable therewith, second and third pulley means fixedly mounted on said first and second rotatable shafts, respectively, first endless belt means stretched between said first pulley means and said second pulley means, second endless belt means stretched between said first pulley means and said third pulley means and first actuating means for moving said second pulley means closer to and away from the axis of said propeller shaft, and second actuating means for moving said third pulley means closer to and away from the axis of said propeller shaft, said first and second actuating means being independently operable from one another to move said second and third pulley means relative to the axis of said propeller shaft independently of one another.

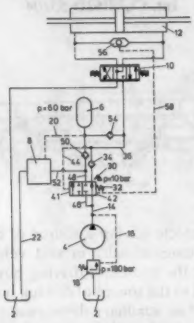
4,204,584
FLUID SUPPLY SYSTEM FOR AUXILIARY POWER STEERING HAVING PRESSURE STORAGE MEANS

Winfried de Maight, Mutlange, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 941,751
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1977, 2742688
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—133 6 Claims

1. An auxiliary power steering system for a vehicle having a reservoir (2) for operating fluid, a pressure storage device (6) pressurized by a high pressure pump (4), a steering control valve (10), and a servomotor (12) connected between said control valve and the reservoir for operation under a maximum operating pressure, the improvement comprising means (8) connected to the reservoir for limiting pressurization of the pressure storage device to a storage pressure less than said maximum operating pressure, a valve assembly (30) alternatively connecting the high pressure pump to the storage reservoir and the steering control valve, having opposed actuating

surfaces (41 and 42), conduit means (36-44) connected between the valve assembly and the steering control valve for supply of fluid under operating pressure exerting a force on one of the actuating surfaces (41) of the valve assembly, and means (58) connecting the servomotor to the other of the actuating surfaces (42) for supply of fluid under the operating pressure in the servomotor exerting an actuating force displacing the



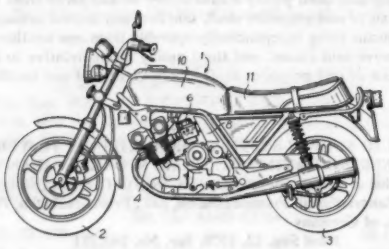
valve assembly from a pump pressure position to a storage pressure position connecting the high pressure pump to the pressure storage device as long as the operating pressure in the servomotor is less than the storage pressure, said valve assembly being connected to the steering control valve whenever the operating pressure in the servomotor is greater than the storage pressure.

4,204,585

CARBURETOR SYSTEM FOR A MULTI-CYLINDER ENGINE OF A MOTORCYCLE

Masaharu Tsuboi, Tokorozawa, and Urataro Asaka, Kamifukuoka, both of Japan, assignors to Honda Giken Kogyokabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1978, Ser. No. 954,295
Claims priority, application Japan, Oct. 25, 1977, 52-127206
Int. Cl.[2] B60K 5/00
U.S. Cl. 180—219 **11 Claims**



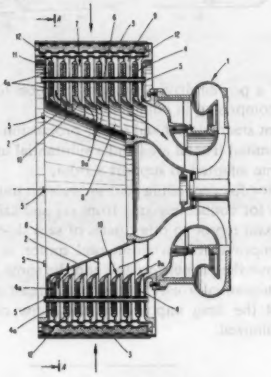
1. In a motorcycle having a frame with front and rear wheels, a multicylinder engine mounted on the frame between the wheels, a plurality of carburetors equal in number to the number of cylinders of the engine and respectively operatively connected thereto, the cylinders of the engine extending laterally in an arrangement of at least two cylinders on each side of a longitudinal axis through the frame, the carburetors being disposed rearwardly of the cylinders, and an air cleaner disposed rearwardly of the carburetors, the improvement wherein said carburetors are arranged in two banks on opposite sides of the longitudinal axis within the confines of the lateral extent of the engine, the carburetors in each bank extending along respective lines which are inclined inwardly toward the front to form an inverse V-shaped arrangement, and means connecting the air cleaner to the respective carburetors.

4,204,586

SILENCER ON THE INTAKE SIDE OF A COMPRESSOR WITH ASSEMBLY OF AXIALLY SPACED ANNULAR SOUND-DAMPING ELEMENTS

August Hani, Turgi; Hansulrich Horler, Zurich, and Hans Ursprung, Turgi, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 725,121, Sep. 20, 1976, abandoned. This application Oct. 13, 1978, Ser. No. 951,049
Claims priority, application Switzerland, Dec. 11, 1975, 16088/75
Int. Cl.[2] F02M 35/00
U.S. Cl. 181—229 **11 Claims**



1. In a silencer construction for connection to the intake side of a compressor which comprises an assembly of axially spaced annular sound damping elements forming air flow passages therebetween, said damping elements being located in a housing part of the silencer which is connected to a convergent intake manifold serving as the main flow path for the ingested air which flows inward through the spaces between the damping elements, the improvement wherein an inner circumference of each of said damping elements merges into an air guiding element having a curvilinear configuration which functions to deflect the partial air flows leaving said air passages between said damping elements in the direction of the main air flow established by said convergent manifold, and wherein the sum of the leaving cross-sections of all of said partial air flow passages is approximately equal to the average flow cross-section of said manifold.

4,204,587

LADDER CONSTRUCTIONS

Clayton E. Larson, Brooklyn, N.Y., assignor to White Metal Rolling and Stamping Corp., Brooklyn, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,068
Int. Cl.[2] E06C 7/08, 7/50
U.S. Cl. 182—228 **10 Claims**

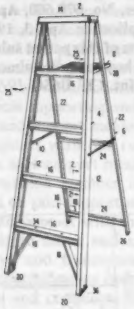
1. In a ladder having at least one section formed of a pair of spaced apart, metal side rails and a plurality of spaced apart, metal steps extending between said side rails, the improvements comprising:

said side rails are channel members defined by a web portion and a pair of lateral flanges,

said steps are channel members defined by a central web and a pair of depending flanges, each said depending flange having an integral offset tip portion and an integral offset portion intermediate said depending flange and said cen-

tral web, said offset portions extending outwardly from said depending flanges and parallel thereto,

said web portion of said side rail channel consisting of a flat base, a pair of integral L-shaped flanges at each end of said lateral flanges forming inside U-shaped cavities at each side of said channel, the width of said cavities being approximately equal to the width of said offset portions of said steps,



said web portion of said side rails and said depending flanges of said cross members being slotted to enable the ends of said cross members to be interlocked with said side rails, and

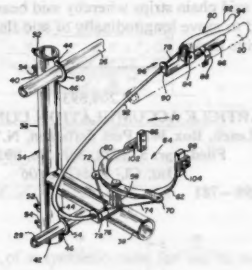
portions of said L-shaped flanges being crimped against tip flanges of said steps to rigidly fix said steps in said side rails.

4,204,588

WHEELCHAIR BRAKING APPARATUS

Henry E. Kawecki, Tabernacle-Medford Lakes Rd., Vincentown, N.J. 08088

Filed Oct. 16, 1978, Ser. No. 951,774
Int. Cl.[2] B60T *1/00*
U.S. Cl. 188—2 F **5 Claims**



1. In a wheelchair, having a pair of armrests, a pair of large primary wheels, a seat, a backrest, a frame, a hand-operated lever brake affixed to said frame for locking said primary wheels, the improvement of auxiliary braking means comprising:

(a) bracket means affixed to said frame proximate each primary wheel;

(b) braking means disposed on each said bracket means, said braking means being disposed proximate each said primary wheel and adapted to come into contact therewith when activated; and

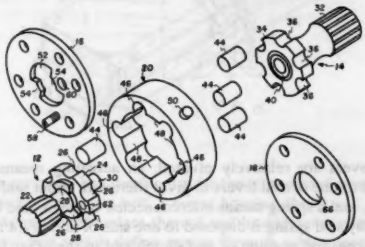
(c) activating means disposed on each said wheelchair armrests proximate said backrest for easy access by the elbows of a person sitting in said seat, each said activating means being operatively coupled to said braking means for activation thereof, causing said braking means to increase its contact with each said primary wheel in response to the pressure exerted on said activating means.

4,204,589

SHAFT DECOUPLING DEVICE

W. Aleck Loker, Leonardtown; Jon L. Bortzfield, Great Mills; Steven D. Chard; John W. Hall, both of Lusby, and John T. Meredith, Lexington Park, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1978, Ser. No. 931,348
Int. Cl.[2] F16D *3/34*
U.S. Cl. 192—27 **12 Claims**



1. A rotary shaft decoupling device comprising:

a driving component having a plurality of equally spaced, axially extending peripheral first grooves;

a driven component disposed in axial alignment with said driving component and having a like plurality of equally spaced, axially extending peripheral second grooves;

a like plurality of rollers disposed in said grooves in spanning relation between said driving and driven components so as to key said components together for common rotation;

retaining means encircling said rollers and components and operative in a first relative rotative position between said grooves and said retaining means to hold said rollers in said grooves;

said retaining means being operative in a second relative rotative position between said grooves and said retaining means to release said rollers from said grooves;

first indexing means for yieldably connecting said retaining means to said driving component for rotation therewith in said first relative rotative position;

yieldable stop means for arresting rotation of said retaining means and causing said first indexing means to yield to continued rotation of said driving and driven components, whereby said grooves are advanced in rotation relative to said retaining means into said second position;

second indexing means, responsive to obtaining of said second relative rotative position, for causing said stop means to yield and said retaining means to again rotate with said driving component; and

said rollers being characterized as being formed of a synthetic plastic materials.

4,204,590

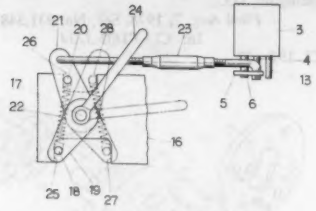
CONTROL MEANS FOR HYDRAULIC CLUTCHES

Shinta Tanaka, Matsuyma, Japan, assignor to Iseki Agricultural Machinery Mfg. Co., Ltd., Matsuyama, Japan

Filed Jun. 2, 1978, Ser. No. 912,000
Claims priority, application Japan, Jan. 9, 1978, 53-000900[U]
Int. Cl.[2] F16D *19/00*
U.S. Cl. 192—99 R **6 Claims**

1. For use with a hydraulic clutch, and a valve means operatively connected to said hydraulic clutch for controlling the flow of fluid pressure to said clutch for effecting the operation of said clutch between an operative engaged position and an

inoperative disengaged position wherein said valve means is remotely disposed from said clutch the improvement of control means for uniformally activating said clutch in a positive manner so as to prohibit any delay in the transition interval of shifting said clutch between an operative and inoperative position comprising a shift lever and a control lever, pivot means for pivotally mounting said shift lever relative to said control lever, whereby said pivot means defines a fulcrum about which



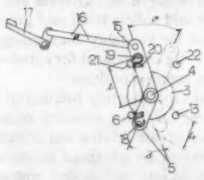
said levers are relatively pivoted; an actuating means connected to one of said levers to pivot therewith about said pivot means, and a spring means interconnected between said levers whereby said spring is disposed to one side of said pivot means in the engaged position of said clutch and to the other side of said pivot means in the disengaged position of said clutch and means interconnecting said valve means to said shift lever whereby the actuation of said valve means is rendered immediately responsive.

4,204,591

CONTROL MEANS FOR HYDRAULIC CLUTCHES

Mitsuhiro Tani, and Hideo Watanabe, both of Matsuyama, Japan, assignors to Iseki Agricultural Machinery Mfg. Co., Ltd., Matsuyama, Japan

Filed Jun. 2, 1978, Ser. No. 912,066
Claims priority, application Japan, Jun. 9, 1977, 52-75351[U]
Int. Cl.² F16D *19/00*
U.S. Cl. 192—99 R **6 Claims**



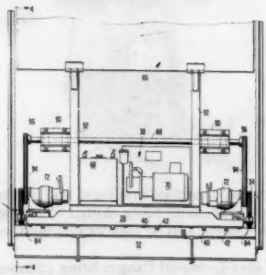
1. For use in combination with a hydraulic clutch and a valve means operatively connected to said clutch to control the flow of fluid pressure to said clutch for effecting the operation of said clutch between an operative engaged position and an inoperative disengaged position, the improvement of a control means for positively actuating said clutch between operative and inoperative positions in a manner which prohibits clutch slippage and with a minimum of delay in the transition interval of shifting of said clutch between operative and inoperative position, said control means including a valve lever connected to said valve means, a shift lever; means pivotally connecting to said shift lever to said valve lever whereby said shift lever pivots relative to said valve lever; a spring means interconnecting to and between the opposed ends of said respective shift lever and valve lever; a control handle, and linkage means interconnected between said control handle and said shift lever whereby said shift lever is rendered responsive to the actuation of said control lever, and said valve lever being activated only when said shift lever pivots relative to the valve lever an amount sufficient to move said spring means through the axis of said pivot means.

4,204,592

LOADING AND UNLOADING APPARATUS FOR VEHICLES

David W. Lutz, and David E. Lutz, both of P.O. Box 39, Carlisle, Pa. 17013

Continuation of Ser. No. 679,600, Apr. 23, 1976, Pat. No. 4,082,196. This application Apr. 3, 1978, Ser. No. 897,961
The portion of the term of this patent subsequent to Apr. 4, 1995, has been disclaimed.
Int. Cl.² B65G *19/20*
U.S. Cl. 198—750 **14 Claims**



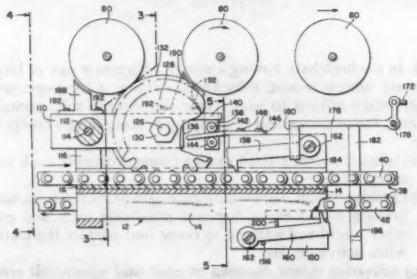
1. A conveyor mounted on a floor, said floor having a top surface, a plurality of substantially endless load supporting flexible strands mounted in a framework on said floor, each of said endless strands having a load supporting run and a return run, a beam connected to said strands, means for moving said beam over said floor, said means for moving said beam comprises a pair of chain strips mounted on said floor and parallel to said endless strands, said chain strips having ends which are fixed to said floor, drive means for driving interengagement with each of said chain strips, said beam being operably connected to said chain strips whereby said beam and said strands are caused to move longitudinally of said floor upon actuation of said drive means.

4,204,593

ARTICLE ACCUMULATION CONVEYOR

John M. Leach, Box 341, Port Jefferson, N.Y. 11777

Filed Apr. 5, 1978, Ser. No. 893,671
Int. Cl.² B65G *13/06*
U.S. Cl. 198—781 **8 Claims**



1. A conveyor for articles comprising a frame, rotatable article supporting and moving elements mounted on said frame, a powered driving element carried by said frame and continuously movable in a given path always free of contact

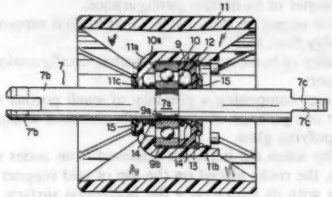
both with said rotatable article supporting and moving elements and the articles being conveyed and having a forward or top run and a return run, a circular shaped movement transmission member, means for mounting said member for rotation thereof by direct contact thereof with said powered driving element and also providing for bodily movement of said particular member so as to contact and transmit rotary movement to at least one of said article supporting and moving elements without breaking contact with said powered driving element, suport means mounted for movement in two directions parallel to the path of movement of said powered driving element and connected with said transmission member to bodily move said transmission member into and out of contact with said at least one of said rotatable article supporting and moving elements, an element mounted on said support means so that a part of it can be projected into contact with one run of said powered driving element to move said support means in a direction to bodily move said transmission member in one direction, a second element mounted on said support means so that a part of it can be projected into contact with the other run of said powered driving element to move said support means in a direction to bodily move said transmission member in the opposite direction, and control means operated by movement of the conveyed articles and connected to each of said last named elements so as to project one of them into contact with one run of said powered driving element when an article is in one position on said rotatable article supporting and moving elements and project the other of said two last named elements into contact with said powered driving element when said article is in another position on said rotatable article supporting and moving elements.

4,204,594

ROLLER OF A SYNTHETIC RESIN USED FOR A BELT-CONVEYOR

Hirokazu Banno, 8, Katasaka, Arao-cho, Toukai-shi, Aichi-ken, Japan

Filed Mar. 10, 1978, Ser. No. 885,253
Claims priority, application Japan, Nov. 26, 1977, 52-158437
Int. Cl.[2] B65G *15/08, 39/10*
U.S. Cl. 198—827 **5 Claims**



1. A roller made of a synthetic resin for use in rotatably carrying a belt of a conveyor, comprising:

a short shaft having on either end portion thereof a coupling portion which permits a rotative movement only in one plane;

a rotary bearing, the inner race of which is force-fitted onto the axially substantially middle portion of said shaft;

a metallic housing of thin walled cylindrical shape with a flange portion on one end thereof, force-fitted onto the outer race of said rotary bearing;

a roller body made of a synthetic resin which is concentrically formed with said housing by insert forming injection molding, said housing being the insert, said roller body having an internal boss portion with a circular groove on the internal surface thereof; and

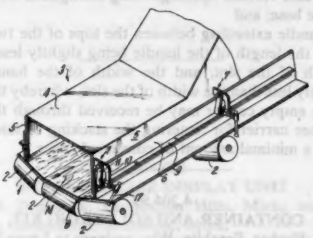
a snap ring fitted into the groove in said boss portion of said roller body, said snap ring cooperating with said flange portion of said housing to secure the position of said rotary being therebetween.

4,204,595

ADJUSTABLE CONVEYOR BELT SKIRTBOARD

Clinton E. Marrs, Carlsbad, N. Mex., assignor to Amax Inc., Greenwich, Conn.

Filed Nov. 16, 1978, Ser. No. 961,180
Int. Cl.[2] B65G *21/20*
U.S. Cl. 198—836 **2 Claims**



1. In a conveyor belt mechanism for the transport of material comprising a conveyor belt, a cover housing above said belt and between the side edges thereof and having bottom edges above said belt which define spaces through which material may pass, and removable, resilient skirtboards which form a barrier against the passage of material off the side edges of said belt through said spaces, the improvement comprising a clamping bar extending along a skirtboard above the bottom edge of said housing, and a plurality of spaced apart clamping means, each of said clamping means being adapted to releasably clamp said skirtboard between said clamping bar and said housing,

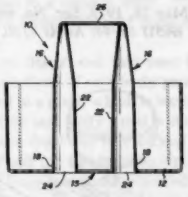
said clamping means comprising a first member attached to the outside of said housing, extending away and downwardly from the point of attachment to said housing and terminating in a threaded hole, a second member which is secured at its lower end to said clamping bar and which is pivotally attached at its upper end to said first member so as to hang below said first member and pivot in a plane which transversely intersects said cover housing, the axis of said threaded hole lying in said plane, and a third member threadedly engaging said hole and movable therethrough into and out of abutting engagement against said second member, at a point below the point at which said second member is attached to said first member, such that such second member pivots and causes said clamping bar to hold said skirtboard against said cover housing.

4,204,596

BOTTLE CARRIER

Frank E. Davis, Arlington, Tex., assignor to Robert E. Smith, Denton, Tex.

Filed Oct. 16, 1978, Ser. No. 951,514
Int. Cl.[2] B65D *01/36, 75/00*
U.S. Cl. 206—203 **26 Claims**



1. A carrier for a plurality of bottles and the like, comprising:

(a) a generally planar base having a longitudinal slot therein, and the base being adapted to receive and support a plurality of bottles, and the base being sufficiently small so that

the carrier may be substituted for equivalent cardboard bottle carriers;

(b) a pair of hollow pillars extending upwardly from the base, with one pillar being adjacent each end of the slot, and the pillars being slightly tapered from their bottoms to their tops, and said pillars each having a relatively long vertical opening on that side which faces the other pillar, with said vertical openings being contiguous with the slot in the base; and

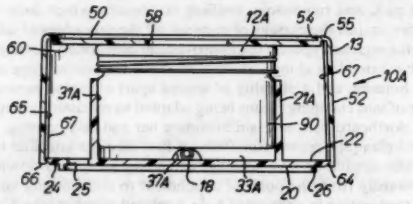
(c) a handle extending between the tops of the two pillars, with the length of the handle being slightly less than the length of the slot, and the width of the handle being slightly less than the width of the slot, whereby the handle of an empty carrier may be received through the slot of another carrier for fostering the stacking of said carriers with a minimal amount of consumed space.

4,204,597

CONTAINER AND SOLDERING KIT

Jerome A. Fischer, Franklin, Wis., assignor to Lucas-Milhaupt, Inc., Cudahy, Wis.

Filed May 16, 1979, Ser. No. 39,663
Int. Cl.[2] A45C *11/00*; B65D *51/24, 85/04*
U.S. Cl. 206—216 **19 Claims**



1. In a container:

a base member including a base plate and a projection extending from one side of said base plate, said projection including a recess therein accessible through an opening in the end of said projection;

means removably supported on said projection and serving to close said opening at the end of said projection;

an outer cover releasably connectable to said base plate and surrounding said projection and said means, said outer cover bearing against said means and having an opening therethrough in registry with said means;

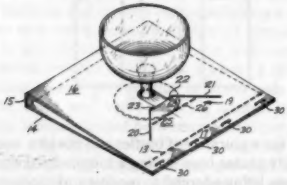
and releasably engageable locking means on said outer cover and said base plate for securing said outer cover to said base member.

4,204,598

VASE HOLDER

Michael G. Adams, Westland, Mich., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed May 31, 1979, Ser. No. 44,275
Int. Cl.[2] B65D *85/44*; A47G *7/00, 23/02*
U.S. Cl. 206—426 **7 Claims**



1. A folder blank comprising:

a bottom panel,

an end panel and

an upper panel,

an elongated slot located centrally of said upper panel,

the long dimension of said slot being in the lengthwise direction of said blank,

the edge of said slot adjacent the free end of said upper panel being formed by the smaller parallel side of a trapezoidal flap, said flap being formed in said upper panel and being defined by side slits in said upper panel, said slits being angled outwardly towards the outer edge of said upper panel, said trapezoidal flap having a scoreline extending between said side slits to divide said flap into upper and lower trapezoidal sections and for reversely folding of the flap back for insertion of said article into said slot and permitting said flap to return to its normal position for blocking said slot.

4,204,599

EDUCATIONAL KIT FOR SOLIDIFICATION OF A CHEMICAL COMPOUND TO PRODUCE CRYSTAL GROWTH

Burton D. Dunn, Phoenix, Ariz., assignor to Lava Gardens, Inc., Phoenix, Ariz.

Filed Oct. 16, 1978, Ser. No. 951,574
Int. Cl.[2] B44D *5/00*; G09B *19/00*
U.S. Cl. 206—575 **7 Claims**

1. An educational kit for generating crystal growth comprising:

a display board having at least one display face,

a hollow irregularly shaped three-dimensional support,

said support having a flange extending laterally from the perimeter of its hollow configuration,

adhesive means for detachable adhering said support to said display face, and

a plurality of items stored in the hollow configuration of said support,

said items comprising a plurality of small porous rocks, at least one package of crystalizable chemical solution and a magnifying glass,

whereby when the items are removed from under said support, the rocks placed on the top of said support when it rests with its flange on a flat horizontal surface, and the chemical solution poured on top of said rocks, crystal formations will occur the detail of which may be observed through the magnifying glass.

4,204,600

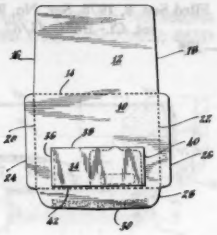
DUAL POCKET ENVELOPE

Sheldon S. Pritchard, Houston, Tex., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 885,603, Mar. 3, 1978, abandoned. This application Dec. 20, 1978, Ser. No. 971,411
Int. Cl.[2] B65D *27/36*
U.S. Cl. 206—610 **2 Claims**

1. A dual pocket easy-opening envelope made from a suitable sheet material comprising a first panel, a second panel hingedly connected to said first panel and substantially coextensive therewith, first and second side flaps hingedly connected to said first panel, said side flaps being folded over and secured to the surface of said second panel to define a first envelope pocket, a separate panel secured at its edges to an inner surface of said first panel to define a second envelope pocket encompassed by the first and second panels, said first

panel further including a cover flap connected to the edge of said first panel opposite the edge to which said second panel is connected, said cover flap being adapted to be secured against said second panel to seal both the first envelope pocket and the second envelope pocket, said separate panel being secured to said first panel on three sides while remaining open at the edge which is adjacent the cover flap on said first panel, a removable access panel defined by a generally rectangular pattern of



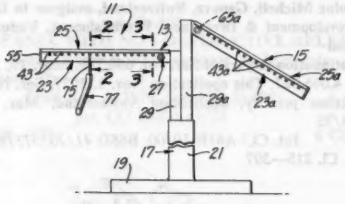
perforations in said first panel, said access panel overlying at least thirty percent of the second envelope pocket, said access panel extending the full height of the second envelope pocket to facilitate removal of the contents thereof, and wherein one edge of said access panel coincides with the edge of said first panel at which said cover flap is connected, said access panel further including a pull-tab at one edge thereof, which pull-tab is formed by a semicircular excursion from one line of perforations into said first panel, the excursion being a continuous cut.

4,204,601

SECURITY DISPLAY RACK

Robert E. Thomas, 2034 N. Olive, Santa Ana, Calif. 92706

Filed May 19, 1978, Ser. No. 907,770
Int. Cl.² E05B 73/00
U.S. Cl. 211—4 **10 Claims**



1. A security display rack for articles, said rack comprising:
an elongated support member having an elongated surface and a plurality of grooves extending through the support member and opening at said elongated surface, each of said grooves being adapted to have at least a portion of one of the articles inserted therein with the grooves spacing the articles along the support member;
an elongated locking member adapted to at least partially cover the open ends of said grooves to impede removal of the articles from the grooves;
means for mounting the locking member for movement to open and at least partially close the open ends of the grooves, said locking member having a closed position in which it lies along the elongated surface of the support member to at least partially close the open ends of all of the grooves sufficiently to impede removal of the articles from the grooves;
locking means for locking the locking member in said closed position;
means coupled to the support member for elevating the support member above a support surface; and
said mounting means including at least one flange on one of said members and at least one recess on the other of said members, said one flange being received in said one recess to permit the locking member to be slid over the open ends of the grooves to open and at least partially close the open ends of the grooves.

4,204,602

EYEGLASS CASE DISPLAY UNIT

Richard S. Dunchock, Farmington Hills, Mich., assignor to Optarac Corporation, Southfield, Mich.

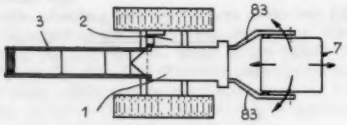
Continuation-in-part of Ser. No. 655,747, Feb. 6, 1976, Pat. No. 4,084,700. This application Apr. 3, 1978, Ser. No. 893,316
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.
Int. Cl.² A47R 7/02
U.S. Cl. 211—13 **3 Claims**

1. A display rack for article of manufacture and the like, said display rack comprising:
a body panel having a plurality of laterally spaced apertures disposed in a vertical arrangement on the outside face of said body panel;
a plurality of article holder members, each of said members having a bottom wall and integrally disposed upright front and rear walls, the front wall being of sufficient size to retain an article on said base surface, the rearward wall extending upwardly and being provided with a pair of laterally spaced tab members adapted to be releasably secured to said body panel by means of engagement with said laterally spaced apertures;
means associated with said body panel for maintaining said body panel in an upright position;
a top flange extending behind said body panel for mounting said body panel to a vertical wall;
a base flange for supporting said body panel in an upright position; and
wherein said top flange and said base flange are integral rearward projections of said body panel, said base flange being disposed in a plane which is inclined with respect to the plane within said body panel is disposed, the perpendicular distance from the face of said body panel to the outer edge of said top flange being equal to the perpendicular distance from said body panel face to the outer edge of said base flange, whereby said body panel is disposed in a vertical plane when said top flange is attached to a vertical wall and said top flange and base portion outer edges abut against said vertical wall.

4,204,603
HIGH-CAPACITY CRANE WITH COUNTER-WEIGHT DEVICE

Jean Ducreuzet, Saint-Etienne, France, assignor to Creusot-Loire, Paris, France

Filed Apr. 27, 1978, Ser. No. 901,010
Claims priority, application France, Apr. 29, 1977, 77 12937
Int. Cl.[2] B66C *23/76*
U.S. Cl. 212—49 2 Claims



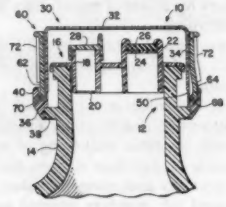
1. A high-capacity crane comprising:

a carrier frame in contact with the ground; a structure which revolves on said frame about a vertical axis; a jib for raising a load and a counter-jib which respectively are articulated on said structure; a counterweight suspended from said counter-jib; said counterweight having a mass providing a greater couple then the maximum couple applied to said counter-jib by the hoisted load; air cushion means located beneath said counter-weight; means for regulating the pressure of air supplied to said air cushion means as a function of the couple applied to said counter-jib by the hoisted load; and a connecting frame articulated to said counter-weight and to said revolving structure

4,204,604
CONTAINER WITH CLOSURE AND CLOSURE REMOVAL MEANS

Marius J. Morin, Westlake Village; Colin J. Nichols, Burlingame, and Myron R. Prouty, Oakland, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Apr. 30, 1979, Ser. No. 34,827
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—257 9 Claims



9. A container with a dispensing outlet, an outer closure having a top wall and a side wall surrounding the outlet and with its base hermetically sealed to an annular abutment about the outlet, and a cutting ring disposed about the outer closure and adapted for severing a portion of the outer closure wherein the improvement comprises:

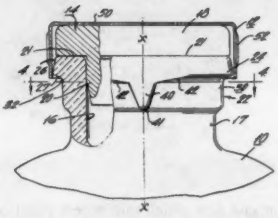
the cutting ring having at least one deflectable tab at its periphery which extends in a direction generally parallel to the axis of the ring and with a sharpened projection on the inner surface of the tab,

the outer closure having an upstanding brim at the base outboard of the side wall providing a groove, the brim having at least one nesting means for accommodating an outer end portion of the tab, whereby the cutting ring may be positioned about the outer closure so as to position the outer end portion of the tab in the nesting means but upon rotation of the cutting ring the tab is forced away from the nesting means and moves inwardly by pressure exerted on it from contact with the inner surface of the brim, thereby forcing the sharpened projection to penetrate and sever the side wall of the outer closure.

4,204,605
CONTAINER-CLOSURE ASSEMBLY

Jacob Ravn, Phoenixville, and William A. Conard, Norristown, both of Pa., assignors to The West Company, Phoenixville, Pa.

Filed Sep. 8, 1978, Ser. No. 940,607
Int. Cl.[2] B65D *41/62*
U.S. Cl. 215—295 16 Claims

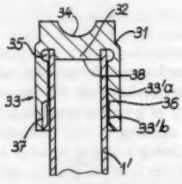


10. A container having a discharge opening, a flange of a predetermined horizontal cross-section projecting radially outwardly from said discharge opening having a side face diverging downwardly from the axial end face of the opening, a shaping surface below said flange of generally elliptical cross-section different than said flange, at least one cam member having a cam surface extending axially downwardly from said flange formed as a continuation of said side face thereof, and which projects radially outward greater than the maximum radial projection of the side face of said flange.

4,204,606
TUBE AND STOPPER COMBINATION WITH VENTING STRUCTURE

Antoine Micheli, Geneva, Switzerland, assignor to DEMATEX Development & Investment Establishment, Vaduz, Switzerland

Continuation-in-part of Ser. No. 668,795, Mar. 19, 1976, Pat. No. 4,066,067. This application Nov. 1, 1977, Ser. No. 847,606
Claims priority, application Switzerland, Mar. 21, 1975, 3634/75
Int. Cl.[2] A61B *10/00*; B65D *41/20, 51/16*
U.S. Cl. 215—307 20 Claims



1. In combination, a vial-type tube and stopper, the tube comprising a neck having an open end, and the stopper comprising a hollow generally cylindrical body of deformable material having a head including a sealing membrane for fitting over and closing the open end of the tube and an integral skirt extending from the head for sealably fitting over the neck of the tube, and means defining in the stopper at least one axially-directed groove extending from the edge of the skirt at least partly along the inner surface of said skirt, said stopper being outwardly movable on the tube from a sealing position in which part of the inner wall of the skirt sealably fits around the

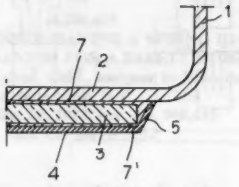
outer wall of the tube neck to a venting position in which said axially-directed groove communicates the interior of the tube with the exterior.

4,204,607

COOKING UTENSIL

Tarcisio Zani, Lumezzane Pieve, Via IV Novembre 3, Brescia, Italy

Filed Nov. 2, 1978, Ser. No. 956,844
Int. Cl.² B65D 7/22; A47J 27/022; B65D 7/44
U.S. Cl. 220—68 **6 Claims**



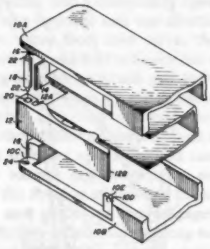
1. Stainless steel cooking utensil comprising a base surface, a protective member having a surface opposed to said base surface and a disc-like insert positioned between said base surface and said insert and attached thereto, said insert being enclosed fully between said base surface of said utensil and said opposing surface of said protective member, said protective member having a peripheral rim running adjacent the periphery of said insert so as to define therewith a spacing, a brazing material being provided between the surfaces to be attached, said brazing material extending within and fully occupying said spacing between said peripheral rim of said protective member and said base surface of said utensil whereby said insert is fully enclosed by said protective member and said protective member is fully attached to both said insert and said bottom surface.

4,204,608

ACCESS PANEL WITH NON-DESTRUCTIVE RELEASE

Donald F. Gatto, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1979, Ser. No. 26,620
Int. Cl.² B65D 43/24
U.S. Cl. 220—335 **6 Claims**



1. A housing having a cavity therein and having an opening in at least one wall of said cavity and comprising in combination:

a door panel dimensioned to cooperate with the opening in the cavity wall to enclose said cavity and including hinge means having protruding retractable portions;

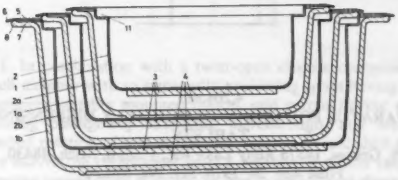
the housing including, adjacent one edge of said cavity wall opening, pivot socket means for retaining said protruding hinge portions, and camming surfaces adjacent the socket means for cooperating with the hinge means to retract said protruding hinge portions when the door panel is pivoted beyond a predetermined position whereby the door panel is released from the housing wall.

4,204,609

COOKING, SERVING AND WARM-KEEPING ARRANGEMENT

Jacques Kuhn, Rikon, Switzerland, assignor to Heinrich Kuhn Metallwarenfabrik Aktiengesellschaft, Rikon, Switzerland

Filed Jan. 16, 1978, Ser. No. 869,492
Claims priority, application Switzerland, Jan. 26, 1977, 955/77
Int. Cl.² B65D 21/02; A47J 36/06, 39/02
U.S. Cl. 220—408 **12 Claims**



1. Cooking, serving and warm-keeping arrangement which includes at least one unit consisting of a serving vessel and a cooking vessel adapted to be nested therein,

the cooking vessel being adapted to be closed by a heat insulating lid,

the serving vessel having a generally horizontally outward extending encircling rim provided with an upward extending encircling bulge at a substantial distance out along its width and substantially at the outward edge of said rim,

the cooking vessel also having a generally horizontally outward extending encircling rim wide enough to extend beyond said bulge, the top of said upward extending encircling bulge forming substantially a line contact with and the only support for the cooking vessel which is so shaped and dimensioned as to otherwise be freely suspended within the serving vessel,

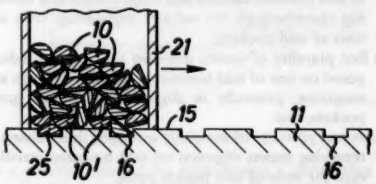
whereby a heat insulating space is provided interiorly of said bulge between the nested cooking and serving vessels including between their generally horizontal rims.

4,204,610

METHOD OF FILLING BLIND HOLES IN A STENCIL

Robert J. Schlaepfer, Niederteufen Ar, Switzerland, assignor to Jacob Schlaepfer & Co. AG, St. Gallen, Switzerland

Filed Sep. 12, 1977, Ser. No. 832,702
Claims priority, application United Kingdom, Sep. 15, 1976, 38252/76
Int. Cl.² B65G 59/06
U.S. Cl. 221—1 **5 Claims**



1. A method of filling blind holes in the upper surface of a stencil with decorative articles to define a particular pattern comprising the steps of, firmly supporting said stencil with said blind holes therein opening in said upper surface, positioning a

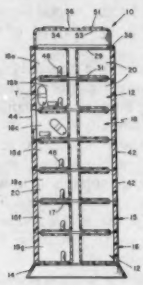
container filled with a stack of discrete decorative articles each of which includes a base portion having at least one planar surface area and an upper portion in an asymmetric configuration with respect to a horizontal plane extending between said base portion and said upper portion to thereby apply localized pressure to said decorative articles in said container, moving said container to move said stack of articles relative to said stencil upper surface for locating a decorative article in each of said holes in a fixed orientation with the upper portion of said article extending above said stencil upper surface and the base portion of said article located within said blind hole whereby lateral translational movement of said decorative articles and the associated pressure assists each article in said hole to adapt said fixed orientation.

4,204,611

APPARATUS FOR CHRONOLOGICALLY DISPENSING TABLETS

Joel S. Graves, 14376 Eddy Lake Rd., Fenton, Mich. 48430

Filed Apr. 20, 1978, Ser. No. 898,307
Int. Cl.[2] B65D *83/04*
U.S. Cl. 221—5 **14 Claims**



1. Apparatus for use in chronologically dispensing tablets comprising:

a cylindrical tablet magazine, having a longitudinal axis, including a plurality of axially disposed, groups of annularly arranged, radially outwardly opening, tablet receiving pockets;

said pockets in each group being axially aligned with the pockets in the adjacent groups to form axially aligned pocket rows;

a plurality of axially abutting, annular closure rings mounted on the radially outer surface of said magazine in transverse alignment with said groups of pockets for retaining tablets in said pockets, each of said rings including a radial opening therethrough for radially registering with selected ones of said pockets;

a first plurality of axially disposed time related indicia, disposed on one of said transverse plurality of rings and said magazine, generally in alignment with said groups of pockets; and

a second plurality of annularly arranged time related indicia receiving means disposed on said magazine axially adjacent the ends of said pocket rows;

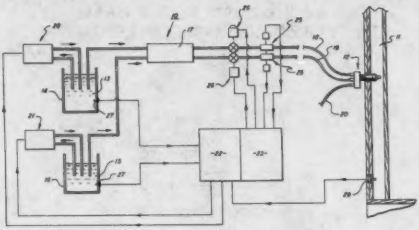
said rings being individually incrementally rotatable about said axis such that a selected one of said openings can be moved into radial registry with a selected one of said pockets to allow any tablets in said selected pocket to be radially dispensed.

4,204,612

SYSTEM FOR APPLYING FOAM INSULATION

Joseph F. Schrader, New Hartford, and Phillip C. Szeliga, Saquoit, both of N.Y., assignors to Foam Controls Inc., New Hartford, N.Y.

Filed May 11, 1978, Ser. No. 904,877
Int. Cl.[2] B29C *11/00*
U.S. Cl. 222—40 **9 Claims**



1. The method of controlling the application of a foam insulation wherein a resin and a foaming agent are pumped through separate lines into a mixing chamber and the mixture injected into a receiving area, the method including the steps of

automatically adjusting the rate of flow passing through each line to compensate for changes in said flow whereby the resin and foaming agent are continually moved into the mixing chamber in the same proportions,

maintaining the temperature of the resin and foaming agent at a constant level,

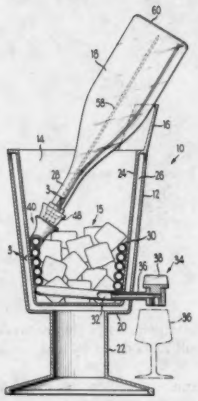
monitoring the air temperature in the receiving area, and automatically changing the temperature of the resin and foaming agent in the event the air temperature moves outside of a desired range.

4,204,613

LIQUID COOLING AND DISPENSING DEVICE

Rouben T. Terzian; Douglas P. Montague, both of Chicago, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 13, 1978, Ser. No. 885,852
Int. Cl.[2] B67D *5/62*
U.S. Cl. 222—146 C **20 Claims**



1. A fluid cooling and dispensing device, comprising:

an insulated container defining a cooling chamber for containing a suitable cooling media such as ice;

heat transfer means defined in said container for circulating

fluid through said cooling media, said heat transfer means including a fluid inlet and a fluid dispenser;

a selectively operable valve having a first end adapted to be coupled to said fluid inlet and a second end adapted to be coupled to a container of fluid, said valve including air vent means communicating with the atmosphere and the interior of said container of fluid; and

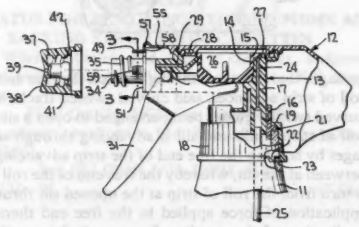
shutoff means including a movable valve element and a post in said fluid inlet engageable therewith for moving said valve element to an open position upon coupling said first end to said fluid inlet thereby allowing fluid flow through said valve and said circulating means.

4,204,614

FLUID DISPENSER HAVING A SPRING BIASED LOCKING MECHANISM FOR A SAFETY NOZZLE CAP

Randy F. Reeve, Walnut, Calif., assignor to Diamond International Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,616
Int. Cl.² B67D *5/32*
U.S. Cl. 222—153 **4 Claims**



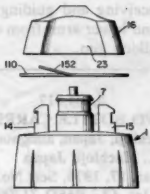
1. A fluid dispenser of the type including a fluid actuator having a nozzle end and containing fluid passages defining a discharge path for fluid from a supply container to a discharge orifice, a needle valve lying adjacent said outlet passage and having a free end, a nipple surrounding said needle valve and extending outwardly of said nozzle end, a nozzle cap having an annular skirt in threaded engagement with said nipple for movement toward and away from said valve end upon cap rotation, said cap having an end wall containing said orifice, said cap being movable into an off position upon rotation thereof in one direction causing said end wall thereof to move toward said valve until said valve end seats against said orifice thereby positively shutting-off discharge therethrough, and said cap being movable into a completely open position upon rotation in a direction opposite said one direction causing said end wall to move away from said valve, the improvement wherein one of said cap and said actuator has a ramp member thereon projecting inwardly toward said valve, the other of said cap and said actuator having a spring-biased tab extending parallel to said valve, said ramp member having an inwardly directed radial surface defining a shoulder and having a surface sloping from said shoulder and defining a ramp, said tab deflecting inwardly toward said valve upon engagement with said ramp during the rotation of said cap toward said off position, whereafter said tab snaps into engagement with said shoulder during further rotation of said cap into said off position to thereby lock said cap in said off position, engagement between said tab and said shoulder preventing rotation of said cap which would cause said valve end to unseat from said orifice, said tab being manually deflectable inwardly toward said valve for disengaging said tab from said shoulder to facilitate rotation of said cap causing said end wall thereof to move away from said valve, and a stop element extending radially outwardly of said nipple, said shoulder engaging said stop element upon movement of said cap into said open position to thereby prevent said cap from moving beyond said open position away from said valve.

4,204,615

FITMENT FOR RENDERING A CONTAINER CHILD-RESISTANT

Robert F. McCarthy, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 3, 1979, Ser. No. 54,513
Int. Cl.² B67D *5/32, 5/00*
U.S. Cl. 222—153 **3 Claims**



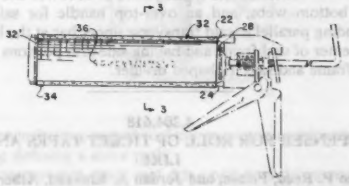
1. In combination with a twist-open closure comprising a shell member with an outwardly projecting spout having a tip member rotatably mounted theron, said sprout having a dispensing passageway extending therethrough, and wherein limited rotation of said tip member relative to said shell member moves the tip member from a position in which said dispensing passageway is closed to one in which said dispensing passageway is open, such tip member being provided with a pair of opposed finger grip depressions to enable gripping for manual rotation thereof between such open and closed positions, a latching member comprising a disc-like body portion adapted to be disposed between the tip and shell members, said disc-like body portion being provided with means to prevent rotation of said latching member relative to said shell member, at least one aperture enabling telescoping of said spout therethrough and a latching lug connected to said body portion, said lug being angulated upwardly out of the plane of said disc and being resiliently deformable towards the plane of said disc whereby when disposed between such tip and shell members said lug will enter a finger grip depression and signal closure when the tip member is rotated into the closed position, the edge of said lug engaging the side of the depression to thereby prevent inadvertent rotation of said tip member into an open position, manual depression of said lug into the plane of the disc moving said latching lug out of the finger grip depression being required to enable rotation of the tip member to the open position.

4,204,616

ADJUSTABLE SAFETY GUIDE FOR SKELETON TYPE CAULKING GUN

Peter J. Y. Chang, 7700 Tremayne Pl., McLean, Va. 22102

Filed Apr. 4, 1979, Ser. No. 27,000
Int. Cl.² G01F *1/00*
U.S. Cl. 222—391 **6 Claims**



1. In a caulking gun of the type having a thrust ring for retaining the nozzle end of a cartridge, a thrust mechanism for ejecting caulking from the cartridge, and, connecting the thrust ring and thrust mechanism, an open frame comprising an upper arm and a lower arm having spacing from the upper arm for receiving a cartridge therebetween from either the left side

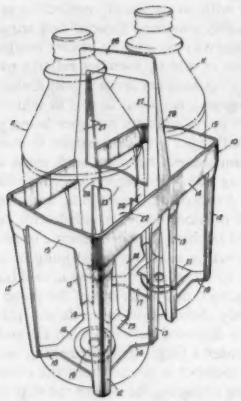
or the right side of the caulking gun, the improvement comprising: a flexible guide for a cartridge, the flexible guide extending between the upper arm and the lower arm, and means securing the flexible guide respectively at the upper arm and the lower arm with sufficient slack in said flexible guide for forming a half-sleeve around a said received cartridge, the securing means permitting the slack in said flexible guide to be pushed toward either said left side or said right side of the caulking gun for receiving and guiding a cartridge inserted between the upper and lower arms from either said left side or right side of the caulking gun.

4,204,617

TWO BOTTLE CARRIER

Kashichi Hirota, Hachioji, Japan, assignor to Kyowa Electric & Chemical Co., Ltd., Hachioji, Japan

Filed Mar. 17, 1978, Ser. No. 887,776
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 A **11 Claims**



1. A carrier for a pair of container units comprising a continuous marginal frame of roughly rectangular configuration and being elongated, opposing pairs of legs depending from said frame near the opposite ends and longitudinal center thereof and forming rectangular arrays of legs with the arrays separated somewhat near the longitudinal center of said frame, bottom webs joined with the lower ends of the legs in said rectangular arrays of legs and forming with the arrays of legs and with said marginal frame a pair of discrete container unit cells, a substantially T-shaped divider separating said cells substantially at the longitudinal center of said frame and including a transverse upper bar joined with opposite sides of said frame and a generally vertical leg substantially at the transverse center of said frame joined at its lower end to one of said bottom webs, and an over-top handle for said carrier extending parallel to said transverse upper bar at the longitudinal center of said frame and having side arm portions joined to said frame and said T-shaped divider.

4,204,618

DISPENSER FOR ROLL OF TICKET TAPES AND THE LIKE

Steven P. Reed, Felton, and Jordan A. Kinkead, Atherton, both of Calif., assignors to Sven Tveter, Saratoga, Calif.

Filed Jul. 7, 1978, Ser. No. 922,563
Int. Cl.² B26F *3/02*
U.S. Cl. 225—106 **13 Claims**

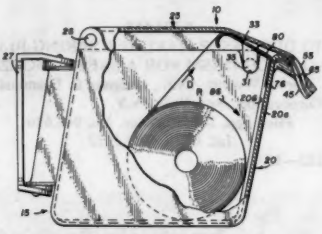
1. A dispenser for tearing strips from a roll of flexible strip with slits at predetermined locations therealong comprising:

(a) a container for housing a roll of strip, and container being formed with an exit opening through which the free end of the roll of strip advances from the container;

(b) means in said container engaging strip of said roll of strip for applying a force to retard the the egress of the strip from said container;

(c) transversely spaced curved twisted tracks projecting from said container over which the free end of the roll of strip advances; and

(d) transversely spaced curved twisted guides projecting from said container in overlying relation to said tracks respectively to form transversely spaced curved twisted



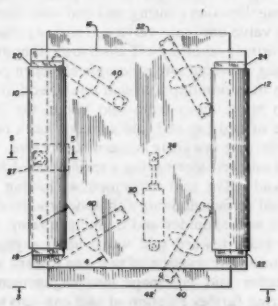
passages therebetween through which the free end of said roll of strip advances, said curved twisted tracks and said curved twisted guides being arranged to open a slit of said roll of strip while said slit is advancing through said passages by bowing the free end of the strip advancing therebetween at the slit, whereby the free end of the roll of strip is torn from the roll of strip at the opened slit through the application of force applied to the free end thereof, the application of the retading force applied by said means and the frangibility of the free end of the roll of strip at the opened slit.

4,204,619

PIVOTED WEB GUIDE FOR TRAVELLING STRIP

Lawrence R. Damour, 16 Chesler Sq., Succasunna, N.J. 07876

Filed May 4, 1978, Ser. No. 902,844
Int. Cl.² B65H *25/26*
U.S. Cl. 226—21 **9 Claims**



1. Apparatus for laterally guiding a travelling web of material which includes: (a) a support frame adapted for securing in a desired attitude to a machine or base; (b) a movable frame pivotally attached to the support frame and carried in a spaced relationship to the support frame, said frame movable in and to a determined limited extent; (c) a pivot post disposed at one end of the support frame and movable frame, this pivot post secured to one of the frames and carrying an antifriction pivot unit which engages and is secured in the other frame so that the movable frame is easily moved around the axis of this pivot

unit with relation to the fixed frame; (d) a plurality of stanchions carried by and secured to one of the frames, each stanchion having mounted therein and thereon opposed ball transfer devices, these opposed ball transfers being adjusted so as to provide a determined spacing therebetween and at an established distance from the attaching surface of the stanchion; (e) a plurality of flat bar members each having parallel faces, each bar secured to that frame not carrying the stanchions, each bar so secured as to present the parallel faces of the bar in a plane normal to the axis of the pivot, each of said bars so positioned that the parallel faces when brought between the ball transfers are engaged on both faces by the ball portions of the opposed ball transfers during the limited movement of the movable frame; (f) a pair of free turning rollers carried in parallel relationship on said movable frame, and (g) mechanically responsive means for moving and controlling the angular position of said pivoted frame, said means responsive to an edge positioning sensing of the travelling web.

4,204,620

APPARATUS FOR REMOVING EXPOSED FILMS AND BACKING STRIPS FROM CASSETTES

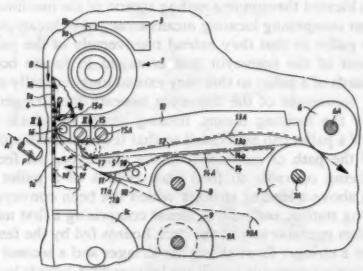
Reinhart Würfel, Münich, Fed. Rep. of Germany, assignor to AGFA-Gavaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 24, 1978, Ser. No. 954,092

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748551

Int. Cl.[2] G03B *1/56*; B65H *17/42*

U.S. Cl. 226—91 **17 Claims**



1. Apparatus for removing films and backing strips from containers of the type wherein a section of the container has registering first and second openings, wherein the leader of the backing strip is located between said openings and wherein said section confines a length of the backing strip to movement in a predetermined direction during intervals between successive exposures of film, comprising a pusher movable forwardly and backwards; locating means arranged to support a container in such position that the openings of said section are in register with said pusher whereby the latter passes, during forward movement thereof, first through one and thereupon through the other of said openings and expels the leader of the backing strip through said other opening; advancing means located behind said other opening and arranged to engage the expelled leader of the backing strip and to advance the thus engaged backing strip lengthwise along a predetermined path to thereby draw the film from the container through the intermediary of said backing strip, said path making with said direction an angle of between 30 and 60 degrees; means defining a film channel having an inlet adjacent said other opening; and means for deflecting the film into said channel in response to advancement of the backing strip along said path.

4,204,621

ROLL SHEET FEEDING DEVICE

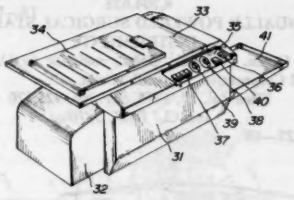
Hiroshi Tsuda, Mitaka, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed Jun. 14, 1978, Ser. No. 916,043

Claims priority, application Japan, Jun. 17, 1977, 52-71150

Int. Cl.[2] B65H *17/26*; G03B *29/00*

U.S. Cl. 226—137 **4 Claims**



1. A roll sheet feeding device comprising: a sheet feed roller for feeding a roll sheet; and a stopping means for stopping said sheet feed roller at least one predetermined position, said means being provided in a midway of a passage through which a driving force is to be transmitted to said sheet feed roller; a diameter and an amount of rotation of said sheet feed roller is so determined that said sheet is fed for a predetermined length until said roller is stopped at a predetermined position after said sheet feed roller starts rotating from a predetermined position; said stopping means being said stopping means being placed into operation before said sheet feed roller completes said amount of rotation, and said stopping means halts rotation of said sheet feed roller at a time when said sheet feed roller completes said amount of rotation; and cutting means operatively engaged with said stopping means when said stopping means halts rotation of said sheet feed roller, whereby said sheet is cut by said cutting means into a predetermined length.

4,204,622

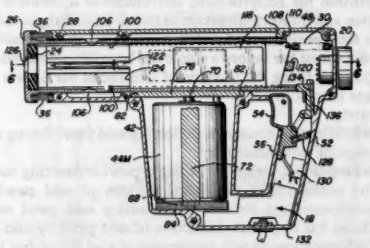
ELECTRIC IMPACT TOOL

James E. Smith, 217 Meadowlook Way, and James D. Cunningham, 2100 Topaz, both of Boulder, Colo. 80302

Division of Ser. No. 580,246, May 23, 1975, Pat. No. 4,042,036. This application Apr. 8, 1977, Ser. No. 785,784

Int. Cl.[2] B25C *1/06*

U.S. Cl. 227—7 **16 Claims**



1. A fastener driving impact tool comprising in combination:
a housing defining a drive path;
ram means movable along said drive path in a drive stroke;
a pair of counterrotating flywheels supported by said housing; and,
means for transferring energy from said flywheels to said ram means to propel said ram means in a drive stroke.

4. A fastener driving method comprising the steps of:
supplying fasteners in sequence to the path of a fastener driving ram;

counterrotating a pair of flywheels to produce opposed precession forces; and

transferring energy from at least one of said flywheels to said fastener driving ram by a generally lateral relative movement and rotation of said flywheel to drive said fasteners in sequence.

4,204,623

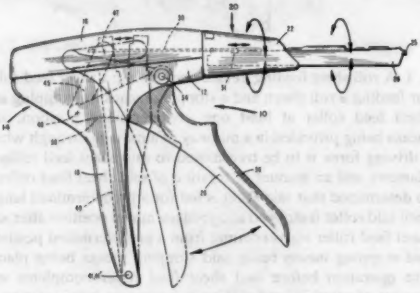
MANUALLY POWERED SURGICAL STAPLING INSTRUMENT

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jul. 17, 1978, Ser. No. 925,170

Int. Cl.² B25C 5/10

U.S. Cl. 227—19 **52 Claims**



1. A manually powered surgical stapling instrument for applying sterilized staples to the disunited skin or fascia of a patient for effecting a joining of the skin or fascia, the instrument adapted to associate with a staple-carrying cartridge having anvil means at one end thereof and adapted to house a plurality of staples therein, a pusher element slidably mounted therein for advancing said staples in said cartridge, for ejecting said staples from said cartridge and for forming said staples around said anvil means, said surgical stapling instrument comprising:

a main body portion;

means for mounting said staple-carrying cartridge on said main body portion;

a thrust bar adapted to be operatively associated with said pusher element and slidably mounted in said main body portion for reciprocative movement in a forward direction and a return direction between an initial position and a final position, said initial position being the position of said thrust bar before a staple has been advanced, said final position being the position of said thrust bar after a staple has been formed;

a pawl;

pawl-deflecting means for deflecting said pawl during movement of said thrust bar;

pawl-mounting means including a pawl-contacting member for contacting a peripheral portion of said pawl, said pawl-mounting means for mounting said pawl on said thrust bar to permit deflection of said pawl by said pawl-deflecting means and movement of said thrust bar in said forward direction and said return direction between said initial and final positions, and for wedging said pawl between said pawl-deflecting means and said pawl-contacting member to prevent said thrust bar from returning to said initial position until said thrust bar has reached said final position during said forward movement of said thrust bar and to prevent said thrust bar from advancing to said final position until said thrust bar has returned to said initial position during said return movement of said thrust bar;

handle means for receiving a manually applied force; and

linkage means for transmitting said manually applied force to said thrust bar to advance said thrust bar and thereby advance, eject and form said staples.

4,204,624

NAILING MACHINE FOR USE IN THE MANUFACTURE OF WOODEN PALLETS

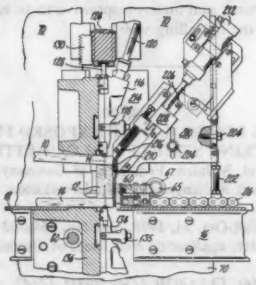
Christopher J. Gunn, Kettering, and Joseph Barker, Glenfield, both of England, assignors to Whitfield Wylie Limited, Kettering, England

Filed Sep. 28, 1978, Ser. No. 946,549

Claims priority, application United Kingdom, Oct. 1, 1977, 40880/77

Int. Cl.² B27F 7/00

U.S. Cl. 227—45 **10 Claims**



1. A nailing machine for use in the manufacture of wooden pallets comprising a conveyor operable to convey pallet components located thereon to a nailing station of the machine, the conveyor comprising locating means arranged to locate stringers of a pallet so that they extend transversely of the path of movement of the conveyor and arranged to locate bottom deck boards of a pallet so that they extend longitudinally of the path of movement of the conveyor beneath the stringers located by the locating means, feeding means in which deck boards of a pallet can be located so that they extend longitudinally of the path of movement of the conveyor, the feeding means being operable to feed deck boards of a pallet into position above a leading stringer which has been conveyed to the nailing station, and nailing means comprising a first nailing mechanism operable to nail the deck boards fed by the feeding means to a stringer from above the stringer and a second nailing mechanism operable to nail the bottom deck boards located by the locating means to a stringer from below the stringer, operation of the conveyor to move the leading stringer away from the nailing station being effective to withdraw the deck boards from the feeding means so that they are located on the following stringers for nailing thereto.

4,204,625

TACK STRIP NAILER

Travis A. Glenn, c/o C. Cantrell, 3215 Ave. G, Dickinson, Tex. 77539

Continuation of Ser. No. 750,263, Dec. 23, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,664

Int. Cl.² B25C 1/02

U.S. Cl. 227—76 **14 Claims**

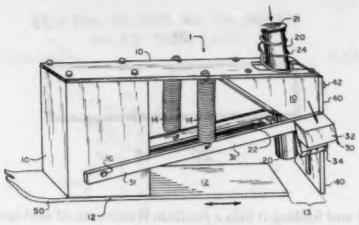
1. An apparatus for installing a tack strip, comprising:

a. a rigid frame for positioning the apparatus with respect to the tack strip to be installed;

b. hammer means for driving nails through the tack strip, said hammer means movable attached to said frame for impacting movement in a vertical direction, and located above the position of the tack strip to be installed;

c. cutting means movably mounted on said frame for severing the tack strip, said cutting means comprising at least one elongated arm movably attached at one of its end

portions to said frame, said arm being provided with a force receptive impact head, said impact head providing a



surface for receiving an applied force capable of severing the tack strip, and said impact head having a cutting blade attached thereto.

4,204,626

WIRE STAPLING APPARATUS

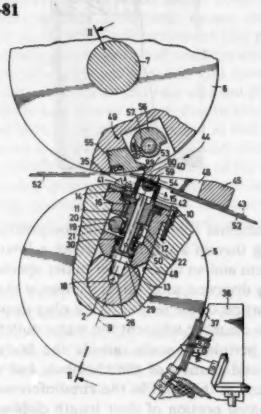
Willi A. P. Kutzner, and Georg Schneider, both of Würzburg, Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,448

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755209

Int. Cl.[2] B25C *5/04*

U.S. Cl. 227—81 **16 Claims**



1. A wire stapling apparatus comprising a rotatable staple closing cylinder and a rotatable wire stapling cylinder coacting with the staple closing cylinder, the wire stapling cylinder having external stapling wire infeed, and means for cutting the wire and forming the cut wire into staples, for individually stapling separated multi-sheet copies, in which a staple conveyor and staple driving punch is disposed on the wire stapling cylinder, the staple conveyor and staple driving punch being capable of being rotated for 90° around a straight radial line extending outwardly from the center of rotation of the wire stapling cylinder, the staple conveyor and staple driving punch being rotatable about the radial line from a first position wherein the staple is formed to a second position wherein the staple is inserted.

4,204,627

STAPLE CLOSING MECHANISM

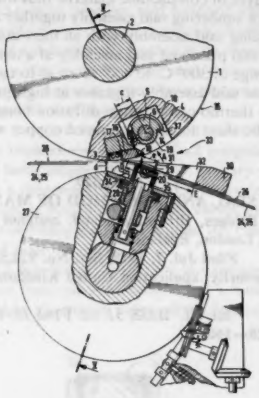
Willi A. P. Kutzner, and Georg Schneider, both of Wurzburg, Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,449

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2755210

Int. Cl.[2] B25C *5/04*

U.S. Cl. 227—81 **14 Claims**



1. A staple closing mechanism for use in a longitudinal stapling apparatus for stapling products which are conveyed at a uniform speed, in which a rigid staple shank bending insert and a rotatable staple shank bending device are positioned on a continuously rotatable staple shank closing cylinder, and in which the rigid staple shank bending insert is disposed to act upon a first staple shank, and the rotatable staple shank bending device is disposed to act upon a second shaft of a staple to be closed to close said staple.

4,204,628

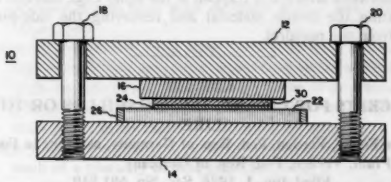
METHOD FOR THERMO-COMPRESSION DIFFUSION BONDING

Douglas E. Houston, Ballston Lake, and James A. Loughran, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,346

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—106 **6 Claims**



1. A method for thermo-compression diffusion bonding a first compliant metallic sheet including first and second opposed surfaces to one of first and second relatively flat opposed surfaces of a structured copper member which may have irregularities in the surface thereof, said structured copper member including a bundle of substantially parallel, closely packed strands of copper of substantially equal length, one common end of said strands forming said first relatively flat surface, the

remaining common end of said strands forming said second relatively flat surface, said method comprising:

positioning the second surface of said first metallic sheet in substantial abutment with the first surface of said structured copper member;

positioning a first layer of compactible material above and in contact with the first surface of said first metallic sheet;

positioning in a high pressure, differential thermal expansion type diffusion bonding press the assembly of said structured copper member, said first metallic sheet and said first layer of compactible material thus formed in preparation for squeezing said assembly together at high pressure;

surrounding said assembly with an inert atmosphere; and

heating said press and said assembly at a temperature within the range of 300° C. to 400° C. so as to cause said press to squeeze said assembly together at high pressure resulting in the thermo-compression diffusion bonding of said first metallic sheet to said structured copper member.

4,204,629

BRUSH SEAL AND A METHOD OF MANUFACTURE

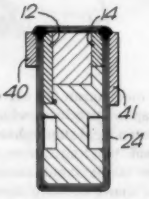
Stuart A. Bridges, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Jul. 7, 1978, Ser. No. 922,522

Claims priority, application United Kingdom, Jul. 20, 1977, 30391/77

Int. Cl.[2] B23K *31/02*; F16J *15/48*

U.S. Cl. 228—160 **7 Claims**



1. A method of manufacture of a brush comprises the steps of:

mounting a first side-plate of rigid material on a mandrel;

winding at least one continuous filament of bristle material onto the side-plate in such a manner that the material lies across an exposed face of the side-plate;

positioning a further side-plate of rigid material to overlie the bristle material on the face of the first side-plate thus sandwiching the bristle material between the two side-plates, leaving some bristle material projecting from one edge of the side-plate pair;

integrally joining the bristle material to the side-plate pair between which it is trapped at the other edge thereof; and

cutting the bristle material and removing the side-plates from the mandrel.

4,204,630

PACKETS FOR CIGARETTES, CIGARILLOS OR THE LIKE

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Pfuhl, Verden, Fed. Rep. of Germany

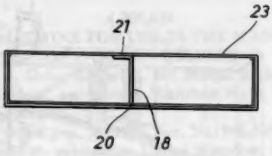
Filed Jun. 1, 1976, Ser. No. 691,810

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1975, 2525959

Int. Cl.[2] B65D *5/48*

U.S. Cl. 229—15 **2 Claims**

1. In a hard box packet for cigarettes, cigarillos, or the like, made from a blank of relatively rigid material, said packet having a folding lid, an insert attached to the blank, and an inner partition formed by said insert to subdivide the pack into two component spaces, said insert having a collar portion adapted to engage said folding lid, the improvements comprising: the partition being attached to the insert on one of its sides and having an edge flap opposite the side of attachment, said subdivision being formed by punching said partition from said



insert and folding it into a position transverse of said insert, said edge flap abutting a wall of said packet opposite said insert and being attached to said opposite packet wall by gluing, welding or the like.

4,204,631

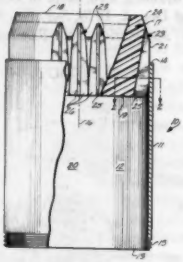
NOZZLE FOR CANOPY-STYLE WATER FOUNTAINS

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Filed Apr. 9, 1979, Ser. No. 28,220

Int. Cl.[2] B05B *17/08*

U.S. Cl. 239—17 **4 Claims**



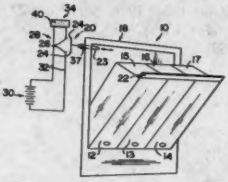
1. An ornamental fountain nozzle comprising an elongate body defining therein a chamber having a lower water inlet opening thereto and an upper water outlet opening therefrom, a plug fixedly disposed across the chamber at the outlet opening with a portion of the length of the plug disposed within a portion of the chamber adjacent the water outlet opening, the plug having peripheral walls outside the body defining an extension of said portion of the chamber, and a plurality of grooves formed at intervals in the circumference of the plug with a substantial portion of their length disposed within the body, the grooves having lower ends communicating with the chamber and upper ends communicating with the exterior of the nozzle only through said plug peripheral walls above the water outlet opening from the body, each groove having a base element therealong most remote from the adjacent peripheral walls of the plug, the base element being inclined outwardly from the length of the plug proceeding upwardly along the length of the groove, each groove having side wall surfaces between the groove base element and the adjacent plug peripheral walls which converge toward each other proceeding upwardly along the length of the groove, the plug between the grooves being engaged in surface-to-surface contact with the chamber walls adjacent the body water outlet opening so that the only outlet of water from the chamber between the plug and the body is via the grooves.

4,204,632

MAIL DEPOSITORY INDICATING ASSEMBLY

Hulet H. Cook, 1541 Leisure Dr., Apt. F-21, Bradenton, Fla. 33507

Filed Dec. 15, 1978, Ser. No. 969,973
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—34 **5 Claims**



1. An indicating assembly of the type primarily designed for indication of opening of a container assembly, such as a mail depository at a location remote therefrom, said indicating assembly comprising: switch means positioned in engaging relation to a predetermined portion of the container assembly and movable between an open and closed position defining a circuit breaking and circuit making position respectively, a power source electrically connected to said switch means and indication means electrically interconnected to said power source and positioned at a predetermined location remote from the container assembly; circuit means at least partially defined by said power source, said switch means and said indication means being electrically interconnected by conductor means, said switch means connected in said circuit in current interruptive relation between said power source and said indication means and disposed to at least reduce current flow to said indication means upon predetermined displacement of the container assembly, said indication means comprising at least one base element and electromagnetic means, said conductor means disposed to electrically interconnect said power source to said electro magnetic means, said one base element formed from a magnetically attracted material; said electro magnetic means removably attached to said base element during current flow thereto from said power source due to electro magnetic attraction, said indication means disposed at said remote location and oriented to allow separation of said electro magnetic means from said one base element because of the force exerted thereon by gravity upon said switch means moving to an open, circuit breaking position and cessation of current flow from said power source to said electro magnetic means.

4,204,633

LOGIC CHIP TEST SYSTEM WITH PATH ORIENTED DECISION MAKING TEST PATTERN GENERATOR

Prabhakar Goel, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,431
Int. Cl.[2] G06F *11/04*
U.S. Cl. 371—27 **9 Claims**

1. A method of testing logic network devices each having primary inputs and outputs and comprising the steps of:

selecting a set of possible device faults to be tested,

selecting one fault of said set for testing to determine if said fault exists at the corresponding node of the device network,

generating a signal test pattern of binary values to be applied at the primary inputs of each logic device to determine the existence of said one fault, and including the steps of:

assigning a binary value to an unassigned primary input,

determining the binary value implications of said assigned value to other nodes of the network,

determining whether the binary values assigned to the primary inputs constitute a test for said one fault by providing a determinative value at a primary output in that a binary value will occur at said primary output if said ond fault is present and the opposite binary value will occur at said primary output if said one fault is not present,

in response to a determination that said assigned binary values do not constitute said test, determining whether said assigned binary values imply a variable value at said fault node,

in response to a determination that said variable value is implied, repeating the above sequence of steps commencing with said assigning step,

in response to a determination that said variable value is not implied, determining whether said assigned values imply the existence of a network block having a variable value at its output and a determinative value at its input,

in response to a determination that said existence of said block is implied, repeating the above sequence of steps commencing with said assigning step,

in response to a determination that said existence of said block is not implied, determining if all assigned primary inputs have been assigned both 0 and 1 binary values,

in response to a determination that all primary inputs have not been assigned both 0 and 1 binary values, determining whether the last-assigned primary input has been assigned both 0 and 1 binary values,

in response to a determination that the last-assigned primary input has not been assigned both 0 and 1 binary values, complementing the binary value of the last-assigned primary input and repeating the above sequence of steps commencing with the step of determining the binary value implications, and

in response to a determination that the last-assigned primary input has been assigned both 0 and 1 binary values, setting the last-assigned primary input to an unassigned variable binary value and repeating the above sequence of steps commencing with the step of determining whether all primary inputs have been assigned both 0 and 1 binary values, and

successively selecting the other faults of said set and repeating for each fault the above sequence of steps commencing with the step of assigning a binary value to an unassigned primary input, thereby generating a signal test pattern for each of the other faults of said selected set,

applying said signal test patterns to the primary inputs of each of a plurality of said logic devices,

measuring the respective output signals at said primary outputs of each of said logic devices in response to said signal test patterns so as to determine the existence and frequency of occurrence of each of said faults,

eliminating from the set of faults to be tested those faults having a frequency of occurrence below a predetermined limit, and

repeating on additional logic devices the above sequence of steps with the set of faults diminished by said fault eliminating step.

4,204,634

STORING PARTIAL WORDS IN MEMORY

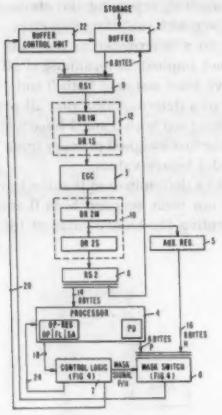
Horst E. Barsuhn, Holzgerlingen; Ulrich Olderdissen, Herrenberg, and Werner Schmidt, Holzgerlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,314

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1978, 2811318

Int. Cl.[2] G06F *11/12*

U.S. Cl. 371—38 4 Claims



1. In the transferring of a partial data block along a data path from a processor to a memory which is protected by the error correcting code unit which is located in the data path and which requires that full data words of a fixed number of bytes be stored in the memory along with error correction check bits generated by the error correcting code unit, the improvement which comprises:

control means for determining if either or both the first and last word of said partial data block are partial words having less than said fixed number of bytes and for generating mark bits identifying bytes missing from said partial words,

prefetch means responsive to the determination of said control means for fetching any stored word said memory that corresponds to any one of said partial words and passing said stored data word thru said error correcting code unit in said data path prior to the beginning of said transferring of the partial data block along said data path to said memory;

register means coupled to said data path for temporarily storing any stored data word fetched by the prefetched means and passed through said error correctoing code unit; and

mask means coupled to said processor, and said register and responsive to said mark bits for combining any said partial word from said processor with its corresponding stored word in said register means to replace bytes missing in said partial word and thereby generate a full data word with said fixed number of bytes for transferring along said data path to said memory through said error correcting code unit.

4,204,635

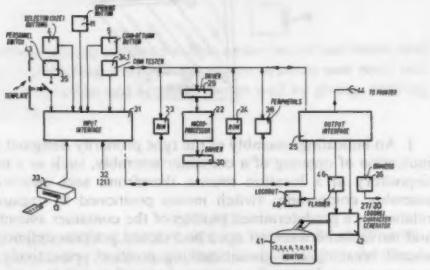
LOCKER INSTALLATION WITH A CENTRAL CONTROL UNIT

Otto Hofmann, Nüremberg, and Georg Nagler, Oberwildenau, both of Fed. Rep. of Germany, assignors to Tele-Alarm, Nachrichtentechnische Geräte GmbH, Herstellungs-und Vertriebsgesellschaft & Co. KG, Schwaig-Behringersdorf, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,686

Int. Cl.[2] G06K *5/00, 15/00*

U.S. Cl. 235—382 7 Claims



1. In a locker installation having a plurality of lockers, a central control unit with a memory and a circuit connected thereto for manual interrogation and display of the occupancy status, and upon manual interrogation of the control unit, for temporarily effective and individual control of respective locker lock opening devices for the respective lockers, the improvement wherein a selector button, a payment due display, a payment comparator, a test data generator, a locker number display, a key card dispenser equipped with a magnetic strip recorded for the locker number and variable test data, as well as a temporarily effective locker door unlocking device, are coupled to circuit means for controlling occupation and access to said lockers, said circuit means being provided with a computer and control system (microprocessor **22**) with memories; a key card reader with test data coincidence control circuitry is provided for reopening of individual doors of said lockers, said reader being connected to an occupied-time-determining circuit, the amount due display, the payment comparator, the locker number display and the temporarily effective locker locking and opening device.

4,204,636

INTERFACE BETWEEN DATA READING WAND AND CASH REGISTER DISPLAY

Richard W. Hayman, Potomac, Md., assignor to Stanley Hayman and Company, Washington, D.C.

Filed Oct. 13, 1978, Ser. No. 950,967

Int. Cl.[2] G06K *15/00, 9/00, 7/10*

U.S. Cl. 235—383 6 Claims

1. In combination with data reading means having encoded data output, display means, processing means, manual input means providing switch closure information, and means directing said switch closure information to said processing means for converting said switch closure information to a format suitable for display on said display means,

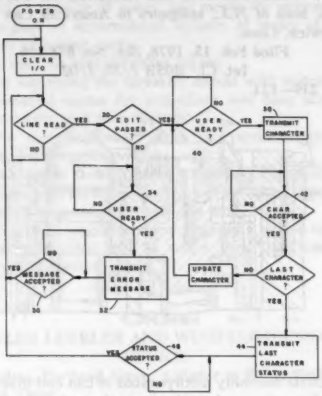
an interface apparatus comprising:

(a) means for converting said encoded data output to data simulating said switch closure information, and

(b) means connecting said data simulating said switch closure information to said directing means,

wherein said processing means and said display means coop-

erate upon receiving information for display from either said manual input means or from said data reading means,



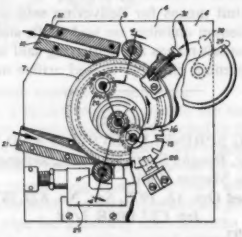
independently of the source of said information for display.

4,204,637

TICKET AND READING DEVICE

Alan M. Gray, 32 Johnston Crescent La., Cove, N.S.W., Australia

Filed Mar. 23, 1978, Ser. No. 889,595
Claims priority, application Australia, Apr. 1, 1977, PC9635
Int. Cl.[2] G06K *5/00, 7/14, 19/06*
U.S. Cl. 235—431 **4 Claims**



1. A ticket reading device for reading indicia on a ticket, said device comprising:

means defining a loading station for sensing the presence of a ticket when presented for reading and accepting the ticket;

a cylindrical drum having means on its outer surface to engage the ticket;

means responsive to sensing of a ticket at said loading station for rotating said drum to rotate the ticket on the surface of said drum about the axis of said drum;

means defining a reading station including first and second indicia sensors, said first indicia sensor positioned for reading a row of indicia along one longitudinal marginal edge of a first face of the ticket as the ticket is rotated on the surface of said drum and said second indicia sensor positioned for simultaneous reading of a row of indicia along the opposite longitudinal marginal edge of the first face of the ticket, said first and second indicia sensors progressively translating the indicia into electrical signals representative thereof; and

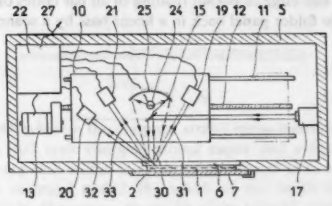
means defining a cancellation station having at least one punch to remove part of the indicia on a ticket after the reading thereof at said reading station for identifiably marking the ticket upon successfully traversing said reading station.

4,204,638

PROCESS OF CODING A CARD WITH A DIFFRACTION GRATING HAVING LINES WITH IRREGULAR SPACING

Jean-Pierre Laude, St. Cyr, France, assignor to Instruments S.A., Paris, France

Filed Feb. 13, 1979, Ser. No. 11,881
Claims priority, application France, Mar. 2, 1978, 78 05976
Int. Cl.[2] G06K *7/12, 19/06*
U.S. Cl. 235—454 **6 Claims**



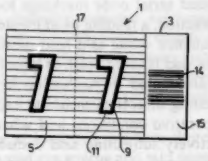
1. In a process for coding a set of access cards adapted to control an apparatus for opening, locking or releasing a processing device and for the ultimate determination of the validity of a card when it is presented in the apparatus, the coding being effected by the formation on the cards of at least one diffraction grating whose recognition is effected by projection of a luminous beam on the grating and analysis of the diffracted beams, the improvement comprising altering the regularity of the grating by producing at least one deviation in the spacing of the lines of the grating which varies periodically with a determined period and maximum amplitude, and detecting the presence of a supplementry satellite diffraction beam produced by the irregularity of the grating when illuminated by said luminous beam to establish the validity of the grating.

4,204,639

CODED LABEL

Donald T. Barber, and Thomas C. Scrymgeour, both of Willowdale, Canada, assignors to Datafile Limited, Willowdale, Canada

Filed Mar. 9, 1977, Ser. No. 775,687
Int. Cl.[2] G06K *7/10, 19/06*; G09F *3/16*; B41F *13/54*
U.S. Cl. 235—462 **4 Claims**



1. A file at least partially coded by means of a plurality of colour coded labels wrapped around a side edge of a file panel and affixed to both sides of a file panel, each of said labels having a colour field, two spaced-apart indicium located in and visually recognizable in said colour field, said label being folded about fold line extending along the portion of said colour field located between said spaced-apart indicium, machine readable bar code off to one side of said colour field and oriented to be machine read in a direction parallel to said fold line, said bar code for each label including start-stop codes to

permit individual reading of each label, said indicium being of sufficient size to facilitate visual recognition, said bar code corresponding to the singular designation of such colour and indicium, each of said labels being identifiable by colour, by its bar code and by its indicium; the colour, bar code and indicium of each label having its singular designation contributing in part to the code of said file, the orientation and relative positions of the indicium and bar code on each label being the same as that on an adjacent label, each of said labels being folded about said panel side edge along said label fold line with the portion of the colour field between said indicium presented along and adjacent such side edge and with said bar code located on the back of said panel, all of which are in generally linear path by virtue of positioning each label fold line along such side edge to permit reading of all bar codes on said labels on file folder panel back in a linear pass by a scanning device.

4,204,640

DOCUMENT HANDLING APPARATUS

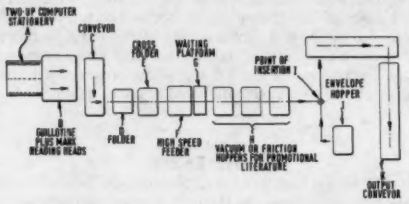
Paul Fuller, Romford, England, assignor to Vickers Limited, London, England

Filed Dec. 31, 1978, Ser. No. 969,089

Claims priority, application United Kingdom, Dec. 16, 1977, 52554/77

Int. Cl.² G06K *13/02, 19/06*

U.S. Cl. 235—476 **9 Claims**



1. Document handling apparatus including document feed means arranged to feed a predetermined document along a predetermined feeding direction through the apparatus, a document constituting said predetermined document bearing selectively provided serial code markings located one after another in said direction, a feeding head located to read said code markings in sequence while said feed means cause said document to traverse said feeding head, at least two document-handling stations distributed in succession beyond said reading head in said feeding direction, means at each said station having idle and operative conditions and when in said operative condition selectively subjecting said document to a predetermined handling operation at that station, synchronisation pulse generation means operable to generate synchronisation pulses for establishing reference timings for the reading of said code markings in dependence upon movement of said document in said feeding direction, and code responsive control circuitry connected between said reading head and said document handling stations and operable in response to the serial pattern of said code markings as read by said reading head at said reference timings for selecting one of said idle and operative conditions at each said station thereby selectively subjecting said document to a predetermined handling operation at that station.

4,204,641

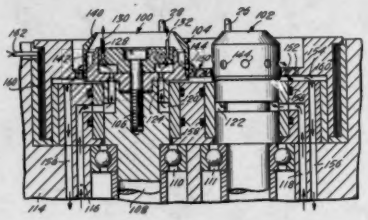
DISPENSING NOZZLE FOR SEALING PLASTICS

John W. Rouse, Fairlawn, and Archibald H. Payne, Scotch Plains, both of N.J., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 15, 1978, Ser. No. 878,016

Int. Cl.² B05B *1/28, 3/02*

U.S. Cl. 239—121 **3 Claims**



1. A nozzle assembly incorporated in can end making apparatus for dispensing sealant plastics to the underside of can ends comprising in combination:

(a) a housing;

(b) a rotatable shaft, received within said housing, having a substantially vertical spin axis, and including an annular plenum chamber for receiving said sealant plastics;

(c) a nozzle head attached to the top end of said shaft to rotate with said shaft within said housing, said nozzle head including orifice means comprising a ring of upstanding substantially vertical, thin walled tubes said ring being substantially centered on the axis of said shaft, with the upper end of each of said tubes being sharply beveled to exposed the the tubing bore thereby forming a radially outwardly disposed tip to facilitate the dislodging of said sealant plastics extruded therefrom;

(d) first conduit means for delivering said sealant plastics into said plenum chamber on said shaft; and

(e) second conduit means for delivering said sealant plastics from said plenum chamber to said orifice means.

4,204,642

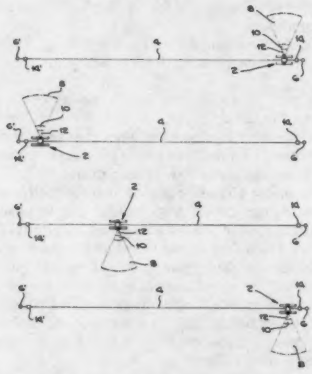
TRAVELING SPRINKLER SYSTEM AND METHOD

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

Filed Oct. 13, 1977, Ser. No. 827,787

Int. Cl.² B05B *3/18*

U.S. Cl. 239—191 **40 Claims**



1. A system for irrigating an agricultural field, comprising:

a pair of stop means positioned on opposite sides of the field and defining therebetween an area to be irrigated,

an intermittent sprinkler means, including means for accumulating a volume of water, and means for intermittently discharging an accumulated volume of water in a long distance irrigating spray,

a mobile base for said sprinkler means,

means for supplying the sprinkler means with water,

water powered means for propelling said base across the field between said pair of stops,

means for diverting water from said sprinkler means to power said propelling means, and

means carried by said sprinkler means and engageable with said stops to reverse the direction of sprinkler travel when the sprinkler means approaches a stop,

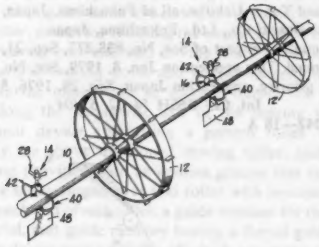
said intermittent sprinkler means operating with a relatively greater volumetric rate of water flow than said water powered propelling means.

4,204,643

SPRINKLER LEVELER AND WIND COMPENSATING DEVICE

Gail Cornelius, Portland, Oreg., assignor to R. M. Wade & Co., Portland, Oreg.

Filed Jul. 12, 1978, Ser. No. 923,715
Int. Cl.[2] B05B *3/02, 12/12*
U.S. Cl. 239—212 **8 Claims**



4. An irrigation apparatus comprising:

a main pipe, a branch pipe secured to the main pipe, water conducting means pivotally connected to the branch pipe, a sprinkler head secured to the water conducting means, a body member, and connector means for interconnecting the water conducting means and body member, wherein the sprinkler head and body member are positioned so that the main pipe lies generally therebetween with the sprinkler head in an erect position, and wherein said connector means is spaced from said main pipe so that said body member, said connector means, and said water conducting means can pivot on said branch pipe relative to said main pipe.

4,204,644

SPRAYING APPARATUS FOR PREPARING GLASS FIBER REINFORCED CEMENTITIOUS PRODUCT

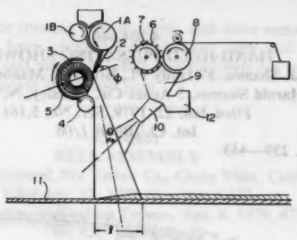
Mikio Kozuka, Yokohama, Japan, assignor to Asahi Glass Company, Limited, Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,918
Claims priority, application Japan, Nov. 18, 1976, 51-137794
Int. Cl.[2] B05B *7/24*
U.S. Cl. 239—220 **12 Claims**

1. A spraying apparatus for preparing a glass fiber reinforced cementitious product comprising:

a roll type cementitious mortar spray means adapted to discharge a transverse sheet of cementitious material; and

a chopped strand spray means adapted to discharge a transverse sheet of chopped strands, including a passage member through which chopped strands fall in a first direction and a second passage forming an angle of 20° to 70° with said first passage, having an elongated outlet of substantially the same width as said roll type spray means which sprays a glass fiber chopped strand along a first axis by air flow into a cementitious mortar flow sprayed along a second axis by the roll type spray means such that a cross angle formed between said first axis and said second axis is



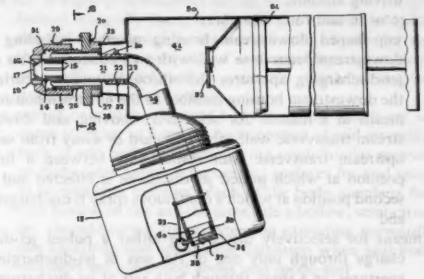
30° to 80° wherein the chopped strand spray means comprises a roll type chopped strand cutter and a first air nozzle disposed within said second passage so as to spray the cut chopped strand, the width of the cutter being substantially the same as the width of the sprayed chopped strand.

4,204,645

GENERAL PURPOSE COMPRESSION-TYPE SPRAYER

Leo A. Hopp, Canoga Park, Calif., assignor to Column Corporation, Van Nuys, Calif.

Filed May 17, 1978, Ser. No. 906,467
Int. Cl.[2] B05B *7/30*
U.S. Cl. 239—341 **8 Claims**



1. Apparatus for spraying material delivered to a nozzle assembly from a supply tank through a supply passage under impulsion of compressed gas from a source thereof applied to the surface of said material in said tank wherein compressed gas from said source is also mixed with said material, comprising:

a cylinder having at least one aperture therethrough interposed between said gas source and said supply passage just upstream of the final aperture of said nozzle assembly, said cylinder having its outer surface in communication with said gas source and its inner surface in communication with said supply passage and being slidable axially in contact with the end of said supply passage;

positioning means including an adjustment nut connected to said cylinder and to said supply passage, at least one of said connections being by means of threads, associated with said nozzle assembly for moving said cylinder axially of the end of said supply passage and thereby controlling the portion of the aperture in the cylinder which is avail-

able for gas flow therethrough and thus variably restricting the flow of compressed gas into said material; and adjustable means interposed between said supply tank and the inlet end of the supply passage for variably restricting the flow of material into said passage.

4,204,646

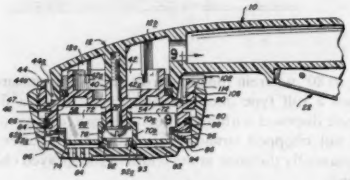
HAND-HELD PULSATING SHOWER

Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502

Filed Jan. 22, 1979, Ser. No. 5,161

Int. Cl.[2] B05B *1/08*

U.S. Cl. 239—443 **17 Claims**



1. In a shower head that includes therein a rotor which aids in providing a pulsed discharge of water jets, the improvement comprising, in combination:

upstream housing means including an upstream transverse wall and downstream extending, axially elongated, inner and outer concentric cylindrical walls that partially define an annular rotor chamber for a rotor, jet forming and directing means in the upstream transverse wall directing jets downstream thereof into the rotor chamber at a rotor driving attitude;

a rotor in said rotor chamber;

a cup-shaped downstream housing member including a downstream transverse wall with two concentric sets of jet-discharging apertures therethrough; means securing the downstream housing member to the upstream housing means in a manner for selectively moving said downstream transverse wall axially toward or away from said upstream transverse wall respectively between a first position at which pulsed jet-discharge is effected and a second position at which a continuous spray is discharged; and

means for selectively discharging either a pulsed jet-discharge through only one of the sets of jet-discharging apertures, or a spray through both sets of jet-discharging apertures.

4,204,647

MINCING MACHINE

Stig K. Jensen, Norreas 65, 4200 Slagelse, Denmark

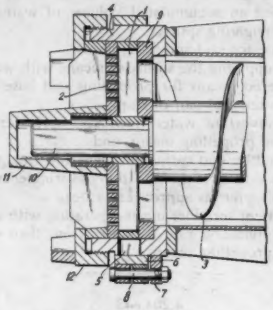
Filed Jun. 16, 1978, Ser. No. 916,405

Claims priority, application Denmark, Jun. 17, 1977, 268577/77

Int. Cl.[2] B02C *18/30*

U.S. Cl. 241—82.6 **4 Claims**

1. A meat grinding machine comprising a cylindrical housing defining a path for meat to be ground, means for advancing the meat along said path, an apertured plate extending across the path and a rotary cutting element disposed in said path adjacent to and upstream of said plate, said housing, in the region of said cutting element having recess means communicating with said path which constitutes a series of aligned co-acting recesses spaced from each other and extending around the periphery of said housing to enable the displacement of meat particles deposited in said recesses with bone fragments included in said meat.



4,204,648

STRAND CUTTING DEVICE FOR CONTINUOUS GLASS FIBER WINDING APPARATUS

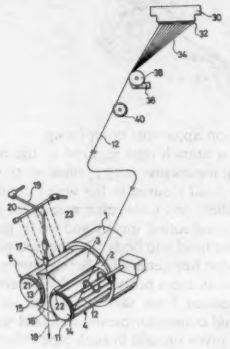
Hisao Minezaki; Akio Haneda; Asanori Masaki; Takeo Hanzawa, and Yukio Uchiike, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation-in-part of Ser. No. 835,277, Sep. 21, 1977, abandoned. This application Jan. 8, 1979, Ser. No. 2,000

Claims priority, application Japan, Sep. 28, 1976, 51/116157

Int. Cl.[2] B65H *54/02, 67/04*

U.S. Cl. 242—18 A **5 Claims**



1. A continuous glass fiber strand winding system comprising; a turntable, a pair of rotatably driven spools mounted on the turntable at winding and standby positions, means for continuously supplying a coated, wet glass fiber strand to the spool at the winding position for winding thereon, means for rotating the turntable when the spool at the winding position becomes fully loaded to thereby index the loaded spool to the standby position and an empty spool to the winding position and simultaneously form a wet bridge strand between the loaded and empty spools, and means for severing the bridge strand while in a wet state to enable continued winding on the empty spool, said means for severing comprising:

(a) a nozzle disposed adjacent the bridge strand and oriented such that a water discharge stream supplied therefrom laterally strikes the wet bridge strand in a substantially perpendicular direction,

(b) means for supplying pressurized water to the nozzle to sever the wet bridge strand, and

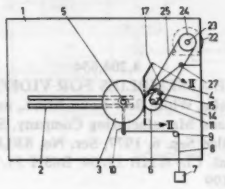
(c) means to synchronize the supply of water to said nozzle with the rotation of the turntable.

4,204,649

SPOOLING MACHINE

Aleidus G. Bosman, 17, Van Bergenlaan, Wassenaar, Netherlands

Filed Aug. 14, 1978, Ser. No. 933,505
Claims priority, application Belgium, Aug. 19, 1977, 180307
Int. Cl.[2] B65H *54/30, 54/48*
U.S. Cl. 242—43 R **5 Claims**



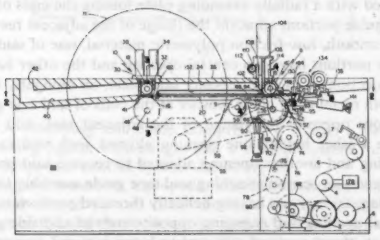
1. In a spooling machine for winding thread-like material, particularly yarns, on a material bearing core which comprises a frame, a bearing axis mounted thereon for the core on which the material has to be spooled, a driving roller mounted on said frame for driving the material-bearing core, means to drive the driving roller, means for effecting the engagement between the material-bearing core and said driving roller to cause driving of the material-bearing core, and a displacement device to reciprocate the material to be spooled during the spooling thereof along the lengthwise axis of the bearing axis, said displacement device comprising a pattern roller which is formed by the above mentioned driving roller, said pattern roller being provided with an endless groove that runs alternately as a screw-thread over said roller with reversing points adjacent each end of said roller, a guide member for the thread-like material, said guide member having a thread guiding portion and a driven part a portion of which enters the groove in the driving pattern roller along which the guide-member is reciprocable, wherein the improvement comprises a second separate groove through which the thread-like material passes, said second groove being positioned at least adjacent the reversing points of said endless groove.

4,204,650

APPARATUS FOR REPLACING ROTATING MANDRELS ON WHICH A WEB IS WOUND

William R. Mengel, Easthampton, Mass., assignor to Magnat Corp., Easthampton, Mass.

Filed Jan. 23, 1978, Ser. No. 871,592
Int. Cl.[2] B65H *19/26, 19/28, 19/30*
U.S. Cl. 242—56 R **41 Claims**



29. Apparatus for replacing a rotating mandrel on which a web is wound, wherein said mandrels have first portions adapted for rolling and second portions adapted for engaging a drive, said apparatus comprising

track means adapted to support said first portions of said mandrels and defining a substantially rectilinear transfer path for said mandrels,

transfer means for causing transfer of said mandrels along said path by rolling of said first portions thereof on said track means; and

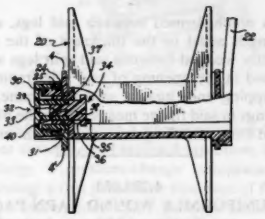
drive means for rotating said mandrels, said drive means being adapted to have operative engagement with said second portions of said mandrels while said mandrels are rolling in said track means along said path.

4,204,651

REEL ASSEMBLY

Joseph G. Haverland, 516 Tallow Ct., Chula Vista, Calif. 92011

Filed Jan. 17, 1979, Ser. No. 4,142
Claims priority, application Taiwan, Apr. 4, 1978, 6721096
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—96 **3 Claims**



1. A reel assembly for storage of lines and the like comprising in combination:

a line storage spool assembly having at each end four flanges formed integrally thereon to retain the line on the spool, one end of said spool having a crank with a handle formed thereon, the opposite end of said spool having an axial, outwardly-directed, hollow extension which has a cylindrical outer bearing surface;

a pair of oppositely disposed body members which are secured together to form the body portion of said assembly, each of said body members having semi-circular recesses on body sides which form bearing surfaces for said spool to be rotatably mounted, each of the body members further having on one and the same side a hollow, semi-circular, thread-bearing frame extension extending outwardly and receiving said spool axial extension when said body members are assembled about said spool; and

frictional brake means operatively mounted on said frame extension and having at least one surface which cooperates with the inner vertical surface of said spool assembly when said brake means is turned on its mounting on said nipple to wedge said spool assembly into frictional engagement with said body portion to control the rotation of said spool assembly.

4,204,652

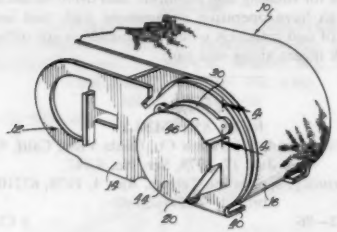
RETRACTOR WITH A COVER ATTACHED TO A SLIDE PLATE

Raymond S. Cislak, Chicago Heights, Ill., and Louis Romanzi, Jr., Milford, Mich., assignors to Gateway Industries, Inc., Chicago, Ill.

Division of Ser. No. 749,176, Dec. 9, 1976, Pat. No. 4,126,923.
This application Jul. 24, 1978, Ser. No. 927,380
Int. Cl.[2] A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—107.4 R **2 Claims**

1. In a seat belt retractor, the combination comprising a metallic retractor frame having a pair of side plates, a belt reel mounted between said side plates for rotation about an axis,

means on the outside of one of said side plates cooperating with said reel, a plastic cover covering said means, openings in said one side frame, a flange means on said cover abutting said one side frame around said openings in said side frame, a pair of split flexible legs integral with said flange means and inserted through one of said openings, enlarged gripping ends in the distal ends of said split legs to engage the interior side of said



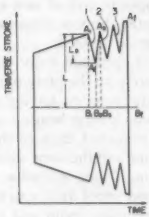
side plate, a notch formed between said legs, a plastic plug having a length equal to the thickness of the flange means inserted tightly wedged between said split legs and located in said notch and in the opening of said side frame to hold said enlarged gripping ends against said side frame, and aligned punch openings in said flange means where the plastic material was punched from said flange means to form said plugs.

4,204,653

NON-UNIFORMLY WOUND YARN PACKAGE

Kenkichi Nose, and Toshihumi Mikumo, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 25, 1979, Ser. No. 33,134
Claims priority, application Japan, May 9, 1978, 53/54040
Int. Cl.[2] B65H *55/04*
U.S. Cl. 242—178 **15 Claims**



1. A yarn package comprising a yarn wound on a bobbin with a traverse stroke back and forth along the axis of the bobbin, the largest traverse stroke being the final traverse stroke in forming the package, wherein during the winding operation thereof, at least for one time the traverse stroke is decreased to a second traverse stroke by a certain amount from a first traverse stroke, which is just before the commencement of the decrease of the traverse stroke, and then, the traverse stroke is increased to a third traverse stroke larger than said first traverse stroke.

12. A process for winding a yarn package on a bobbin, comprising the steps of:

providing relative rotational motion between the yarn and the bobbin about the bobbin longitudinal axis;

causing the yarn to be fed to the bobbin along a path generally transverse to said longitudinal axis;

reciprocating said path with a series of successive traverse strokes between the ends of said bobbin to wind said yarn on said bobbin,

a first of said traverse strokes having a given amplitude,

a second of said traverse strokes following said first traverse stroke having an amplitude less than said given amplitude, and

a third of said traverse strokes following said second traverse stroke having an amplitude greater than said given amplitude,

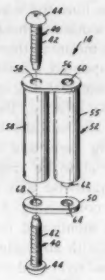
whereby said yarn package is provided with a variation in effective winding height which minimizes irregularities in the yarn due to compression and relaxation stresses.

4,204,654

TAPE GUIDE ASSEMBLIES FOR VIDEO CASSETTES

Charles D. Gebeke, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1977, Ser. No. 830,812
Int. Cl.[2] G11B *23/04*; B65H *23/26*
U.S. Cl. 242—199 **2 Claims**



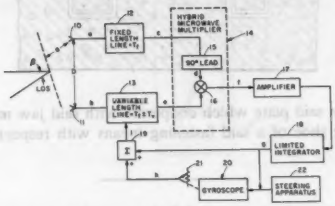
1. In a video tape cassette comprising a housing; a predetermined length of magnetic recording tape; first and second reels rotatably mounted in said housing, each of said reels comprising a hub and only one flange fixed at one end of the hub, each end portion of the tape being attached to and wound about a different one of the hubs and each of said reel flanges having a sufficient diameter to cover the entire side surface of the tape when almost all of the tape is wound around that hub, said reels being mounted in said housing in axially parallel spaced positions with said flanges overlapping and on opposite edge surfaces of the tape between said reels; and means mounted on said housing for defining a tape path between said reels comprising at least one tape guide assembly adjacent each of said reels, one of said tape guide assemblies including two axially parallel, closely spaced arcuate side guide portions guiding the side surfaces of said tape therebetween and being integrally formed with a radially extending plate joining the ends of said side guide portions adjacent the flange of the adjacent reel of a stiff, smooth, low-friction polymeric material, one of said side guide portions having a central opening and the other having a projection at its end opposite said plate; an elongate, hard, smooth metal edge guide washer at the ends of said side guide portions opposite the flange of the adjacent reel, said edge guide washer having one opening aligned with said central opening and another opening adapted to receive said projection; and two screws attaching said tape guide assembly to said housing, said screws having helically threaded portions in said central opening and engaging opposite ends of said side guide portion, the threads of said screws being inclined away from the leading ends of the screws to afford pressing said screws into said side guide portion and subsequent threaded engagement therewith.

4,204,655

BROADBAND INTERFEROMETER AND DIRECTION FINDING MISSILE GUIDANCE SYSTEM

Joseph F. Gulick, Clarksville; James S. Miller, and Alan J. Pue, both of Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1978, Ser. No. 964,767
Int. Cl.[2] H04B 7/00
U.S. Cl. 244—3.19 7 Claims



1. A wide bandwidth interferometer comprising in combination a pair of spaced antennas;

means for delaying the signals detected by one of said antennas by a fixed amount and the corresponding signals detected by the other of said antennas by a variable amount;

means for shifting the phase of the signals delayed by said fixed amount by a positive 90° and for multiplying the phase shifted signals and the signals delayed by said variable amount;

means for integrating the product signal; and

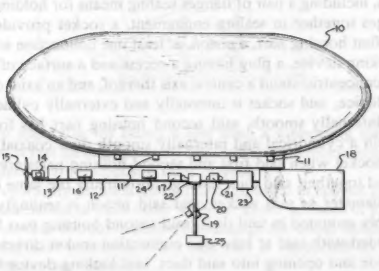
means for adjusting the orientation of said antennas and said variable amount in accordance with the signal developed by said integrating means so as to align an axis that is perpendicular to the line connecting said antennas with the incoming direction of the signals detected by said antennas.

4,204,656

AIRSHIP CONTROL SYSTEM

DeWitt C. Seward, III, Box 434, Bethel, Conn. 06801

Continuation-in-part of Ser. No. 765,093, Feb. 2, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,266
Int. Cl.[2] B64B 1/02, 1/24
U.S. Cl. 244—30 3 Claims



1. A freeflying miniblimp comprising a frame, a balloon containing lighter-than-air gas and a control system for said miniblimp, said control system consisting of:

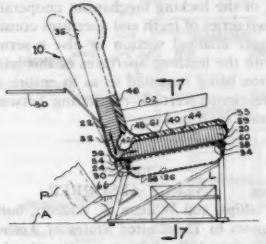
a single drive motor, a propeller attached to said drive motor and rotated by said drive motor, a bracket to which is mounted said drive motor, an ascent/descent motor, first means for attaching said ascent/descent motor to said bracket to tilt said drive motor upward or downward, a left/right motor, second means for attaching said left/right motor to turn said drive motor left or right, a single fixed vertical stabilizer secured to said miniblimp and having an absence of moving parts, an energy source and control means for said motors functionally connected to said motors.

4,204,657

LIFE AND WEIGHT SAVING AIRCRAFT SEAT STRUCTURE

Edward F. Graham, 349 Rosebank Ave., Baltimore, Md. 21212

Filed Jun. 30, 1978, Ser. No. 920,955
Int. Cl.[2] B64D 11/06, 25/04
U.S. Cl. 244—122 R 18 Claims



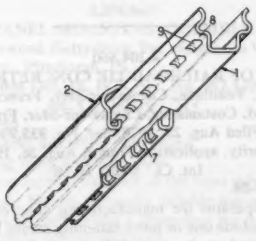
1. In an aircraft seat having a frame including leg structure supporting seat structure and seatback structure, the improvement comprising: a pressure-change compensating seating system comprising: a first pneumatic structure of flexible material including a seat cushion and a seatback cushion, a second pneumatic structure of flexible material comprising an overflow envelope, a first pneumatic connection between the seat cushion and the seatback cushion, a second pneumatic connection between the first pneumatic structure and the overflow envelope; the first pneumatic structure flexible material being substantially inelastic and the overflow envelope flexible material being substantially elastic, the overflow envelope having means providing an initial elastic inflation pressure threshold followed by progressively increasing resistance to inflation, and said providing means comprising the overflow envelope having wall thickness varying between a minimum thickness at a first location and a maximum thickness at a second location.

4,204,658

SEAT-SUPPORTING SLIDES

Bernard Courtois, Etampes, France, assignor to Societe Industrielle Bertrand Faure, Etampes, France

Filed Jan. 16, 1979, Ser. No. 3,895
Claims priority, application France, Jan. 18, 1978, 78 01370
Int. Cl.[2] F16C 29/02
U.S. Cl. 248—430 18 Claims



1. A seat slide comprising a lower channel section intended to be fixed to the floor of a vehicle, an upper channel section intended to be fixed to the sitting portion of the seat, intermedi-

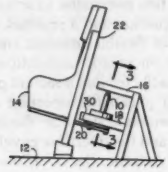
ate members such as balls placed between these two channel sections, and a locking mechanism actuatable by the person sitting in the seat and comprising a toothed belt mounted on the upper channel section and adapted to coact with a series of equidistant catches of the lower channel section, characterized in that it comprises, on the one hand, on one of the two channel sections, a series of equidistant teeth of identical widths whose free end is orientated vertically or at least in a direction very little inclined from the vertical and, on the other hand, on the other channel section, a series of closed apertures adapted to receive the above teeth and which, for the locked positions of the upper channel section, are disposed vertically opposite said teeth in a direction such that any vertical movement upwards of the upper channel section tends to make the teeth go into the apertures, the series of teeth or apertures with which the toothed bolt of the locking mechanism cooperates being that one, of the two series of teeth and apertures considered, which is on the lower channel section or else a series of catches associated with the teeth or apertures of this latter series, the bolt in question being mounted so as to ensure automatically the above mentioned vertical registering between teeth and apertures during each locking.

4,204,659

ENERGY ABSORBER

Norman S. Phillips, and William B. Walcott, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washingtion, D.C.

Filed Apr. 25, 1978, Ser. No. 899,956
Int. Cl.[2] B60R *21/10*
U.S. Cl. 248—562 **19 Claims**



1. Apparatus for absorption of forces from a support structure imposed upon a mass movable with respect thereto, comprising:

lost motion means adapted to be connected between the mass and the support structure for introducing lost motion between the support structure and the mass for a preset limited relative displacement of the mass with respect to the support structure; and

constant level means connected to said lost motion means and adapted to be connected between the mass and the support structure upon accomplishment of the lost motion, for maintaining the forces received by the mass at a predetermined constant level after completion of the lost motion.

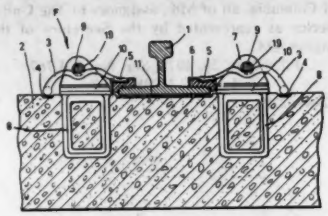
4,204,660

PROCESS OF RAILROAD TIE CONCRETE CASTING

Jean-Louis J. Feuillade, Cagnes-sur-Mer, France, assignor to Societe B.M. Costamagna, Cagnes-sur-Mer, France

Filed Aug. 23, 1978, Ser. No. 935,994
Claims priority, application France, Aug. 26, 1977, 77 26046
Int. Cl.[2] B22D *19/08*
U.S. Cl. 249—86 **9 Claims**

1. Mold apparatus for manufacturing concrete ties of the type which include one or more fastening means having a shoe which is located at the top of the tie and a projecting tab portion, said apparatus comprising: a mold for the tie, a plate for attachment to said mold, said plate formed with an opening to accept the shoe of a corresponding fastening means, movable jaw means on the underside of said plate for engaging a predetermined part of the projecting tab portion of the fastening means to align the same with respect to the mold, and stop



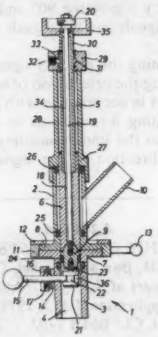
means on said plate which cooperate with said jaw means to align the shoe of a said fastening means with respect to the mold.

4,204,661

WASTELESS CONNECTING VALVES

Thore Stromberg, P.O. Box 295, S60104 Norrkoping, Sweden

Filed May 3, 1978, Ser. No. 902,303
Int. Cl.[2] F16K *35/02*
U.S. Cl. 251—95 **2 Claims**

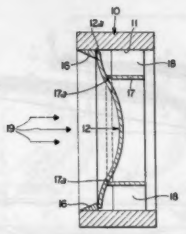


1. A wasteless connecting valve, first and second housing parts, including a pair of flanges sealing means for holding said flanges together in sealing engagment, a socket provided on said first housing part, a piston, at least one connection socket, a locking device, a plug having a recess and a surface of rotation concentric about a central axis thereof, and an axial drawing device, said socket is internally and externally cylindrical and internally smooth, said second housing part has formed therein a cylindrical and internally smooth duct coaxial with said socket when said first and second housing parts are connected together, said duct having substantially the same internal diameter as said socket, and said piston is sealingly and slidably mounted in said duct, said second housing part being provided with said at least one connection socket directed to the side and opening into said duct, said locking device being disposed in said first housing part so as to engage in a locking position said recess in said plug, said plug being slidably and sealingly mounted in a throughbore of said first housing part and, said piston including a bottom surface which abuts a corresponding surface of said plug, said bottom surface and said corresponding surface being substantially coplanar with the interfaces of said flanges disposed so as to be pressed by said axial drawing device with said surface of rotation against said corresponding surface of rotation on said piston to effect a seal therebetween.

4,204,662
VALVE FOR CONTROLLING THE FLOW OF FLUIDS IN CONDUITS AND THE LIKE

Anthony C. Reynolds, 821 Overbey Dr., Mobile, Ala. 36608

Filed Mar. 23, 1979, Ser. No. 23,036
Int. Cl.[2] F16K 1/00
U.S. Cl. 251—334 3 Claims



1. In a valve having a body and a passageway therethrough for flow of fluid to be controlled,

(a) a closure in the form of a plate-like member,

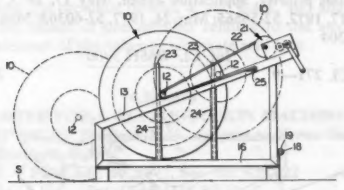
(b) seals for the periphery of the closure carried by the valve body and located upstream from the closure member, and

(c) means associated with the valve body located in position for a portion of the closure intermediate its center and periphery to contact the same, whereby when under pressure downstream deflection of the central portion of the closure results in upstream deflection of the peripheral portion of the closure, causing the peripheral portion to come into sealing contact with said seals.

4,204,663
APPARATUS FOR LIFTING A REEL

William E. Baughn, Bessemer, Ala., assignors to Milton J. Baughn, Bessemer; Kenneth R. Williams, Alabaster; M. K. Khristan McAlister, Mountain Brook, all of Ala.

Filed Apr. 2, 1979, Ser. No. 26,081
Int. Cl.[2] E02C 3/00
U.S. Cl. 254—88 5 Claims



1. In apparatus for lifting a reel from a supporting surface with said reel having centrally disposed axle members projecting laterally from opposite sides thereof,

(a) upwardly inclined guide rails supported in spaced parallel relation to each other with the upper surfaces of lower portions thereof in position to engage the under surface of said axle members while said reel is supported by said supporting surface,

(b) a flexible member operatively connected to each said axle member and extending toward the upper portion of the guide rail adjacent thereto,

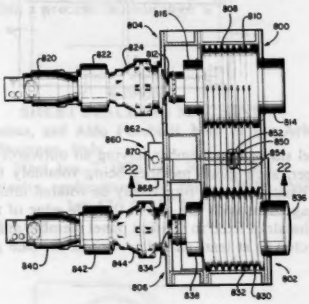
(c) drive means operatively connected to the flexible members and adapted to pull said flexible members and the axle members connected thereto toward said upper portions of said guide rails so that said axle members are moved upwardly along and are supported by said guide rails as the reel is lifted above said supporting surface, and

(d) movable stop members adapted to project above said guide rails in position to engage said axle members and limit downward movement thereof along said guide rails to thereby hold said axle members at at least one selected position along said guide rails.

4,204,664
WINCH MECHANISM FOR CRANE

John F. Bryan, Jr., Dallas, Tex., assignor to Pyramid Manufacturing Company, Houston, Tex.

Continuation-in-part of Ser. No. 721,775, Sep. 9, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,605
Int. Cl.[2] B66D 1/76
U.S. Cl. 254—175.7 6 Claims



1. In a crane having a boom with a first end adapted for securing a load thereto and a second end pivotally attached to a base for supporting the boom therefrom, a winch mechanism comprising:

a first drum having multiple grooves therein,

a second drum having multiple grooves therein,

a first frame for rotatably supporting said first drum for rotation about the axis thereof,

a second frame for rotatably supporting said second drum for rotation about the axis thereof,

means for pivotally attaching the first frame to the second frame for canting the first drum relative to the second drum with the axes of rotation of the first and second drums being maintained in parallel planes,

adjustment structure attached between the first and second frames for adjusting the cant of the first drum relative to the second drum,

a cable alternately wrapped between the grooves of said first and second drums, one end of said cable extending along the boom to the first end of said boom, and

means for driving at least one of said drums to draw in or let out said cable.

4,204,665
PANEL MOUNTING ASSEMBLY

Edward F. Sherwood, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 18, 1978, Ser. No. 952,520
Int. Cl.[2] E04H 17/14
U.S. Cl. 256—65 3 Claims

1. A hung panel assembly, comprising:

a wall having front and back sides,

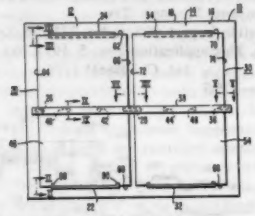
a fixed bottom support member on the front side of said wall,

a downwardly biased, vertically slidable top support member upon said wall having a depending leg portion spaced from the front side of said wall,

a first panel member having first and second major opposed surfaces, and side, top and bottom edges, said top edge having a longitudinal groove therein, at least one of the side edges of the first panel member has a slot therein,

said first panel member being supported between said top and bottom support members, with the depending leg portion of the top support member extending into the groove in the top edge of said panel member,

said first panel member being removable from said bottom and top support members by an upward movement thereof having sufficient force to overcome the downward bias of said support member,



a panel side guide member having an outwardly extending finger, such guide member being rotatably fixed to the wall such that the finger may be rotated into and out of engagement with the slot in the side edge of the panel,

and a handrail fixed to the first panel member at an elevation selected to at least partially conceal the side guide member.

4,204,666

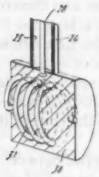
IN SITU FURNACE METAL DESULFURIZATION/NODULARIZATION BY HIGH PURITY MAGNESIUM

Prem P. Mohla, Canton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 856,697, Dec. 2, 1977. This application Sep. 18, 1978, Ser. No. 943,274

Int. Cl.[2] **C21C** *1/02*; **C22C** *33/10*; **C21C** *7/02*; **D02G** *3/00*

U.S. Cl. 266—216 **1 Claim**



1. A metal treating element, comprising:

(a) a sodium silicate body;

(b) a non-destructible lance connected to said body for plunging same into a molten pool;

(c) a helical screw shaped insert of magnesium, cast within said body.

4,204,667

SEMI-CIRCULAR STACK SHEET FEEDING APPARATUS

Emil Klenk, Murrhardt, Fed. Rep. of Germany, assignor to Maschinenbau Oppenweiler GmbH, Oppenweiler, Fed. Rep. of Germany

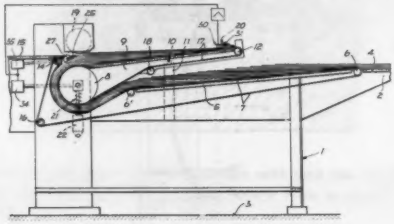
Filed May 23, 1978, Ser. No. 908,834

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724617

Int. Cl.[2] **B65H** *1/22*

U.S. Cl. 271—3.1 **10 Claims**

1. In a semi-circular sheet feeding apparatus having a supply platform adapted to be loaded with an imbricated stack of sheets and a removal platform, delivery and diverting means including a diverting drum for transporting the imbricated stack of sheets in a first delivery direction along a lowermost periphery of said drum, about the drum and, in a second delivery direction, onto the removal platform and means for driving said delivery and diverting means, and means arranged downstream of the removal platform for removing the uppermost sheet on the removal platform in a direction opposite the second delivery direction, the improvement comprising stop



means provided on said removal platform for abutment of the leading edges of the sheets transported to the removal platform and stack height detection and drive control means for sensing the number of stacked sheets lying with their leading edges against said stop means and for maintaining said drive means engaged with said delivery and diverting means until a predetermined number of stacked sheets on the removal platform is sensed.

4,204,668

PAPER FEEDING APPARATUS

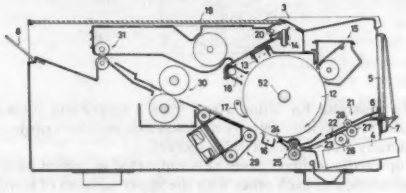
Nobuyuki Yanagawa, Chigasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed May 11, 1978, Ser. No. 905,044

Claims priority, application Japan, May 17, 1977, 52-56564; May 17, 1977, 52-56565; May 24, 1977, 52-60303; May 24, 1977, 52-60304

Int. Cl.[2] **B65H** *3/06*

U.S. Cl. 271—9 **31 Claims**



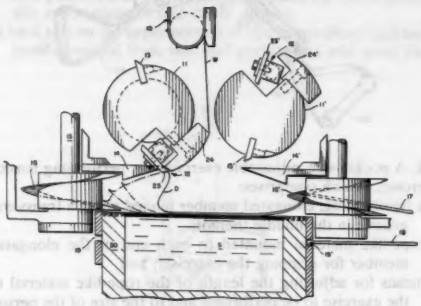
1. Paper feeding apparatus for copying machines, comprising a path along which a manually loaded sheet of paper is conveyed, a cassette feed path along which a sheet from a cassette is conveyed, a manual feeder operable to feed a sheet which is placed on the manual feed path in a given direction, a cassette feeder operable to feed sheets contained in a sheet cassette one by one onto the cassette feed path, single feed control means responsive to a single feed signal to operate the manual feeder and the cassette feeder simultaneously, and feed mode switching means operable to selectively establish a manual feed mode and a cassette feed mode.

4,204,669

METHOD AND APPARATUS FOR ZIG-ZAG FOLDING

Ernst D. Nystrand, De Pere, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Continuation-in-part of Ser. No. 823,350, Aug. 10, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,494
Int. Cl.[2] B65H *45/16*
U.S. Cl. 270—73 5 Claims



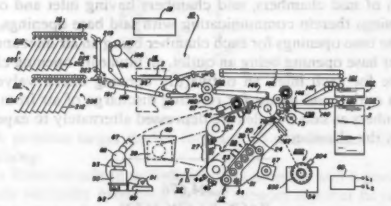
1. In a method for zig-zag folding a web wherein a web is fed between a pair of rotating folding members, each member having at least one tucker and one gripper, said gripper having an anvil and a gripper element, all of said tucker, gripper anvil and gripper element being shaped to define a tip on each, said members being disposed relative to each other to position the tucker of one member in web tucking engagement with the gripper of the other member to cooperate in folding said web, the steps of perforating an elongated web along a plurality of longitudinally spaced apart transversely extending lines, advancing said web at a given speed between said members, moving the tucker of one member between an anvil and gripper element on the other member to fold the web substantially along a perforation line while maintaining each of said gripper anvil tip and gripper element tip a constant distance from the tip of said tucker during entry of said tucker into said gripper, repeating the above step of folding at succeeding perforation lines to form a zig-zag folded stack, said gripper anvil tip rotating at a speed equal to the web given speed, visually ascertaining the presence of lean in said stack, and angularly shifting the tucker of one member relative to the anvil and gripper element of the other to eliminate said lean.

4,204,670

SORTER FOR A REPRODUCTION MACHINE

Robert L. Traister, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,022
Int. Cl.[2] B65H *39/10*
U.S. Cl. 271—287 7 Claims



1. In a sorter for receiving copies from a reproduction machine processor, the sorter including a plurality of spaced bins, the improvement comprising:

means for selecting one of the bins;

sorter inlet sensor means for detecting a copy sheet entering the sorter;

a timer, said sorter inlet sensor means initiating actuation of the timer upon detection of a copy sheet entering the sorter;

means for calculating the proper time for the copy to travel from the sorter inlet sensor means to the selected bin;

bin entry sensor means for detecting a copy sheet entering the selected bin;

means for loading the timer with the calculated time, said sorter inlet sensor means causing the timer to activate;

means for reading the timer when a copy sheet has entered a bin as detected by said bin entry sensor means; and

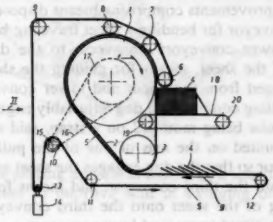
means for declaring a fault if the reading from said timer is not within a predetermined range.

4,204,671

SHEET STACKING MACHINE

Giorgio Pessina, and Aldo Perobelli, both of Via Arborina 2, Paderno Dugnano, Italy

Filed Jun. 7, 1978, Ser. No. 913,322
Claims priority, application Italy, Nov. 3, 1977, 22637/77[U]
Int. Cl.[2] B65H *29/68*
U.S. Cl. 271—186 3 Claims



1. A machine for stacking sheets, said machine comprising:

(A) means for feeding said sheets,

(B) means for receiving said sheets and disposing said sheets in a stacked arrangement,

(C) a roller proximate to said receiving means,

(D) means for driving said roller,

(E) a first set of spaced belts,

(F) means to guide said first set of belts for movement along a path having a portion partially encircling said roller and a portion extending between said feeding means and said receiving means,

(G) a second set of spaced belts,

(H) means to guide said second set of belts for movement along a path having a portion surrounding said first set of belts at said portion encircling said roller to define with said first set of belts, in operation, a means for transferring said sheets between said feeding means and said receiving means, and a free-wheeling clutch having a driving member and a driven member, said driving member being driven for rotation by said driving means for said roller, and said driven member being in operative engagement with said second set of belts, said clutch being engaged when the peripheral speed around the roller of the second set of belts drops to or below the peripheral speed around the roller of the first set of belts and being free-wheeling when the peripheral speed around the roller of the second set of belts exceeds the peripheral speed of the roller of the first set of belts, whereby the free-wheeling clutch is operative when the sheets have a thickness below a given value and disengages and acts as an overrunning clutch when the sheets have a thickness above said given value.

4,204,672

DEVICE FOR CONVEYING SHEETS WITHIN A SHEET PROCESSING MACHINE

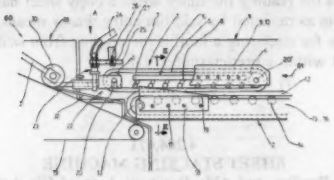
Francis Grivet, Morges, Switzerland, assignor to J. Bobst & Fils, S.A., Lausanne, Switzerland

Filed May 24, 1978, Ser. No. 909,035

Claims priority, application Switzerland, May 26, 1977, 006477/77

Int. Cl.[2] B65H *29/70*

U.S. Cl. 271—188 5 Claims



1. In a device for transferring a sheet from one station to a second station, said device including a first station with at least one lower conveyor and at least one upper conveyor arranged to discharge the sheet onto a third conveyor at the second station the improvements comprising means disposed adjacent the lower conveyor for bending a sheet traveling between the upper and lower conveyors transverse to the direction of movement of the sheet, means for guiding the sheet as it is being discharged from the upper and lower conveyors, said means for guiding comprising a dog adjustably engaged within a tube, said tube being mounted on a strap, said strap being pivotably mounted on the axis of one of the pulleys of the upper conveyor so that the dog engages the sheet as it is being discharged onto the third conveyor, and means for ensuring the depositing of the sheet onto the third conveyor as it is discharged from said upper and lower conveyors.

4,204,673

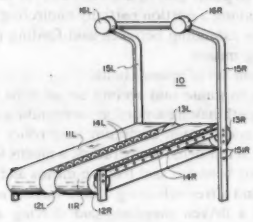
DUAL-TREAD EXERCISER

John Speer, Sr., 1425 Bedford St., Stamford, Conn. 06905

Filed Dec. 14, 1978, Ser. No. 969,438

Int. Cl.[2] A63B *23/06*

U.S. Cl. 272—69 10 Claims



1. An exercising machine comprising a first treadmill having a first continuous tread for the left leg of the user; a second treadmill having a second continuous tread for the right leg of the user; means for supporting said first and second treadmills and treads parallel to, and adjacent to, each other for supporting the weight of the user thereon; a first means for independently controlling the motion of said first treadmill tread; a second means for controlling the motion of said second treadmill tread and operable independently of said first means; and arm support means extending above the plane of said treads for grasping by the user.

4,204,674

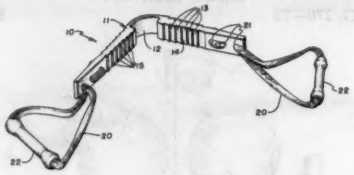
POCKET-SIZE, ADJUSTABLE EXERCISER

Thomas W. Ogland, 2192 Medina Rd., Long Lake, Minn. 55356

Filed May 16, 1978, Ser. No. 906,613

Int. Cl.[2] A63B *21/32*

U.S. Cl. 272—126 8 Claims



1. A pocket-size, adjustable exerciser for performing tension exercises, which comprises:

a freestanding, elongated member hinged along a transverse groove in the middle thereof;

rope-like material mounted to each end of the elongated member for gripping the exerciser; and

means for adjusting the length of the rope-like material to the exercise to be performed and to the size of the person using the exerciser.

4,204,675

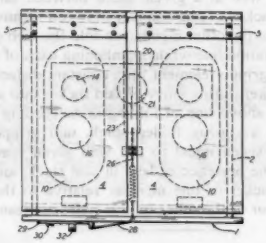
AIR CHAMBER LEG EXERCISING DEVICE

Gerald E. McGinnis, Monroeville, Pa., assignor to Monicor Corp., Monroeville, Pa.

Filed Aug. 2, 1978, Ser. No. 930,314

Int. Cl.[2] A63B *21/00*

U.S. Cl. 272—130 7 Claims



1. An exerciser comprising a base having front and rear ends, a pair of laterally spaced foot treadles overlying the base and hinged at their front ends to the front end of the base, the treadles normally being inclined with their rear ends raised above the base, a normally inflated flexible air chamber mounted between each said treadle and the base and attached thereto, the base having a pair of openings therein beneath each of said chambers, said chambers having inlet and outlet openings therein communicating with said base openings, one of the base openings for each chamber being an air inlet and the other base opening being an outlet, an inwardly opening check valve for each inlet, an outwardly opening check valve for each outlet, and means for resisting discharge of air from said chambers as said treadles are depressed alternately to expel air from the chambers.

4,204,676

BACK EXERCISER

Edmond W. Givens, 724 Stella St., Vallejo, Calif. 94590

Filed Dec. 21, 1977, Ser. No. 862,684

Int. Cl.[2] A63B *21/04*

U.S. Cl. 272—136 9 Claims

1. An exerciser comprising, a frame having an upper portion

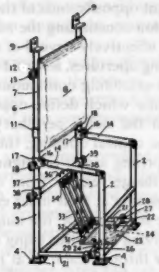
for receiving the back of a user and a lower portion for receiving the feet of a user, said upper portion being substantially in a plane that is substantially perpendicular to a plane formed by the lower portion,

a pedal on the lower portion of the frame,

a heel portion on said pedal,

a pivot on the lower portion of the frame connected to said pedal spaced from said heel portion thereby to support said pedal rockably about a fixed axis to a position generally in the plane of said lower portion,

a back rest on the upper portion of said frame above said heel portion spaced from said heel portion and said pivot axis



to correpond to the position of the user's back when standing on said pedal,

handle bars on each side of the frame between said pedal and said back rest within reach of the user standing on said pedal,

and resilient means connected to the heel portion of said pedal so as to urge said heel portion toward said back rest whereby the user by bracing his back against said back rest and pulling with his hands on said handle bars and depressing while pivoting said heel portion of said pedal about said axis with his heels repeatedly exercising his back muscles.

4,204,677

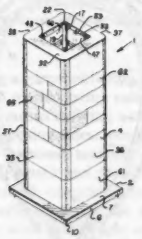
BASEBALL THROWING PRACTICE TARGET

Michael J. Haggarty, 8453 Carter, Overland Park, Kans. 66212

Filed Jan. 12, 1978, Ser. No. 869,017

Int. Cl.[2] A63B *69/40*

U.S. Cl. 273—26 A **4 Claims**



1. A practice target device for baseball and like activities, comprising:

(a) a frame structure including a base member and a generally vertically extending upright support member having its lower end connected to said base member;

(b) said upright member comprising a plurality of upright elements arranged in a rectangular pattern, each of said upright elements comprising a corner of said rectangular pattern; and

(c) a plurality of block members having generally flattened top and bottom surface and outer sides, said sides having various target design patterns applied thereon;

(d) each said block member having an aperture extended therethrough from said top to bottom surfaces and sized to receive said upright member, said block members being selectively rotatable in a horizontal plane and selectively positioned in stacked engagement with said upright member extended through said apertures whereby various target design patterns appear on said target device in desired placement.

4,204,678

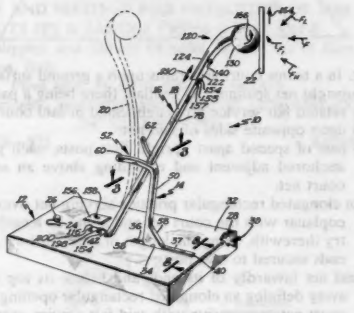
TENNIS PLAYING APPARATUS

Ray P. Weis, 404-14th St. SE., Austin, Minn. 55912

Filed Aug. 15, 1977, Ser. No. 824,446

Int. Cl.[2] A63B *61/00*

U.S. Cl. 273—29 A **10 Claims**



1. A tennis playing apparatus usable by a tennis player with a tennis racket to improve skill in swinging of the racket, comprising:

a base;

a post member carried by and extending upwardly from said base;

a substantially elastic, flexible wand member having upper and lower ends, said lower end being carried by said base and said wand member extending upwardly from said base, and including target means adjacent said upper end, said wand member being flexibly movable between an initial position, wherein said wand member contacts said post member, and a second position wherein said wand member is spaced from said post member in response to striking of said target means by the racket;

said post member further including wand receiving means on said post member to receive said wand member as it returns from said second position to said initial position and said wand receiving means including a V-shaped bifurcated receiver having the arms of said V diverging laterally outwardly from an apex so as to receive said wand member therebetween and guide said wand member along said arms as said wand member returns from second to initial position and direct said wand member to said apex;

said wand member further including a shaft and a cap unit;

said cap unit carrying said target means and positioned adjacent the upper end of said wand member and said cap unit being movably mounted relative to said shaft for sliding movement along said shaft between upper and lower displaced positions spaced vertically from an intermediately positioned rest position; and

said wand member further including biasing means between said cap unit and said shaft to bias said cap unit to said rest position and to urge said cap unit to said rest position from any displaced position so that said cap unit is free to float relative to said shaft between said displaced positions so as

to simulate the feel of a live tennis ball when said target means is struck by the racket.

4,204,679

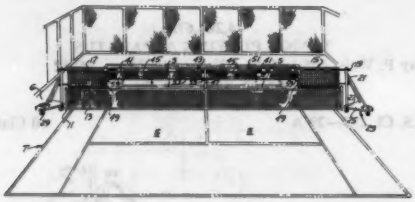
TENNIS PRACTICE SERVING NET

Harry E. Kreuzman, 5201 Cherokee Dr., Troy, Mich. 48098

Filed Oct. 25, 1978, Ser. No. 954,510

Int. Cl.[2] A63B *61/00*

U.S. Cl. 273—29 A **9 Claims**



1. In a tennis court apparatus upon a ground surface having an upright net spanning its median, there being a pair of laterally related fair service areas delineated in said court adjacent and upon opposite sides of said net;

a pair of spaced apart upright first posts, each post being anchored adjacent and extending above an end of the court net;

an elongated rectangular practice serving net overlying and coplanar with the court net and along its length, in registry therewith, along the length of said court net, and at its ends secured to said posts;

said net inwardly of its ends and below its top being cut away defining an elongated rectangular opening over said court net coextensive with said fair service areas;

an upright divider post upon and intermediate the ends of said practice serving net extending the height thereof, and dividing said rectangular opening into a pair of rectangular openings;

and a pair of curtains of net material coplanar with said serving net at their top edges connected thereto and depending into said pair of openings respectively, with their lower edges adjustably spaced above said court net providing a pair of elongated adjustable height service apertures of receiving a served tennis ball so as to fall within one of said fair service areas.

4,204,680

RACKETS

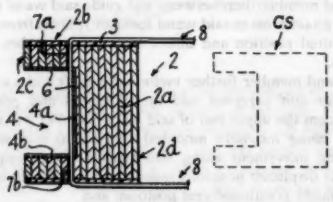
Robin M. Blackburne, Ardsheal Cottage, Paget 6-20, Bermuda

Filed Apr. 10, 1978, Ser. No. 895,021

Claims priority, application United Kingdom, Apr. 20, 1977, 16502/77

Int. Cl.[2] A63B *51/06*

U.S. Cl. 273—73 D **8 Claims**



1. A games racket comprising a handle intended to be held in the hand, and carrying a head having a frame defining a central opening, across which extends tensioned stringing carried by the hand, the stringing being composed of two sets of stringing with each set being disposed in a respective one of two spaced generally parallel planes, and being composed of first and second groups of mutually parallel string portions, the string portions of the first group being interwoven with, and generally perpendicular to, the string portions of the second group, the stringing including portions interconnecting the string portions in the two sets, the interconnecting portions passing through apertures distributed around the periphery of the frame, opening at their outer ends into opposite side surfaces of the frame which are spaced apart in a direction generally normal to the planes of the stringing, the cross-sectional profile of the frame resembling an "extended D" having a body portion and extensions projecting generally transversely from the body portion adjacent opposite ends of the upright limb of the "D", said body portion constituting the main structural part of the frame and being effectively devoid of structurally weakening stringing-receiving apertures, and said extensions constituting a pair of flanges extending continuously around the outer periphery of the frame which define opposite side walls of a channel provided in the outer periphery of the frame and extending around the central opening, the stringing-receiving apertures each comprising a pair of aligned aperture portions formed on in each flange remote from the outer peripheral edges thereof and opening at their inner ends into the channel directly adjacent the base thereof, the number and disposition of the stringing-receiving apertures being such that the stringing passes only once through each of at least the majority of the aperture portions, with the interconnecting portions passing through and located in the stringing-receiving apertures and extending across the channel between the inner ends of the aperture portions in the two flanges, and with at least one of the ends of the stringing knotted-off within the channel, the knot anchoring the stringing with respect to one of the flanges adjacent the inner end of an associated aperture portion.

4,204,681

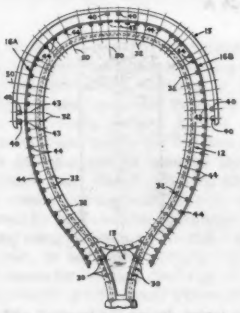
GAME BALL RACKET WHEREIN CERTAIN RACKET COMPONENTS ARE STRUCTURALLY INTEGRATED WITH THE RACKET FRAME BY THE STRING WITH WHICH THE RACKET IS STRUNG

Harleston J. Hall Jr., Princeton; Roger I. Sassin, Morganville, and Drew J. Yuhas, Cranbury, all of N.J., assignors to AMF Incorporated, Plainsboro, N.J.

Filed Jul. 13, 1978, Ser. No. 924,154

Int. Cl.[2] A63B *49/00*

U.S. Cl. 273—73 C **1 Claim**



1. In a game ball racket including a frame having an upper portion having a plurality of holes formed therealong, and further including a handle at the opposite end thereof, and still further including a grommet strip surrounding said upper portion of said frame and wherein said grommet strip is provided with a plurality of grommets extending inwardly therefrom and into predetermined ones of said holes formed in said frame, said grommets and said frame holes for receiving string

and said upper portion of said frame having an upper peripheral portion, the improvement comprising:

said grommet strip being provided with a plurality of grommets at predetermined positions therealong and said grommets extending into predetermined ones of said holes formed in said racket frame and said grommet strip being further provided with a plurality of holes at predetermined positions therealong and which holes align with predetermined ones of said holes formed in said racket frame;

a bumper strip for surrounding said upper peripheral portion of said frame and for protecting against injury to one of two players upon one of said two players inadvertently striking the other player with said upper peripheral portion of said racket during the course of play with said racket;

said bumper strip provided with a plurality of grommets at predetermined positions therealong and said grommets extending into said predetermined holes formed in said grommet strip and into predetermined ones of said holes formed in said racket frame;

said bumper strip also being provided with a plurality of holes at predetermined positions therealong and which holes align with predetermined ones of said grommets provided on said grommet strip; and

upon said racket being strung with said string, said string being received within (i) said grommets and said holes formed on said bumper strip and (ii) said grommets and said holes formed on said grommet strip, and upon said string being tightened, said string forcing said bumper strip and said grommet strip into tight engagement with said frame whereby said bumper strip is structurally integrated with said grommet strip and said frame and whereby said bumper strip cannot be removed from said racket without removing said string whereby said racket is rendered inoperable for play.

4,204,682

METHOD AND APPARATUS FOR OUTDOOR TOSSING GAME

Floyd E. Brown, 218 7th St., Wood River, Ill. 62095

Filed Nov. 10, 1977, Ser. No. 850,158
Int. Cl.[2] A63B *65/10, 67/06, 57/00*
U.S. Cl. 273—401 **10 Claims**

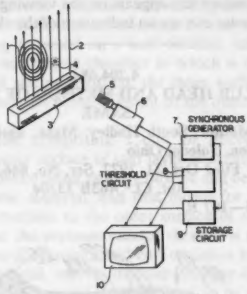
10. A kit for playing a game including a plurality of groups of metal markers, each marker being substantially round with flatted opposing sides, means defining a central hole extending between said flatted opposing sides, means forming a covering over substantially all exposed surfaces of the marker, said covering being made of plastic and protecting the marker from substantial damage during extended use, said marker being sufficiently heavy in relation to its size to substantially minimize the effects of the wind on its flight as it is tossed, a receptacle suitable for being recessed flush into a substantially flat playing surface and receiving said markers as they are thrown, said receptacle having a substantially cylindrical sidewall with an upper and lower edge, said edges being substantially parallel and each edge forming a surface substantially perpendicular to the central axis of the receptacle with a diameter sufficiently larger than the diameter of the marker to permit relatively frequent tossing of the marker into the receptacle from a substantial distance therefrom, said receptacle having a depth sufficient to accept a substantial number of markers positioned therein with their flatted surfaces aligned substantially parallel to the top and bottom edges of the sidewalls, a protective cover for covering the opening of the receptacle after it is recessed into a playing surface to prevent the entry of contamination thereinto and for safety purposes, said protective cover including a cylindrical cap having a top and bottom surface approximately circular with a diameter larger than the diameter of the receptacle and an inner flange being approximately cylindrical in shape with a diameter of less than that of the receptacle, said inner flange being centered on and extending downwardly from the bottom surface of the cylindrical cap, the protective cover thereby fitting on to the upper opening in the receptacle with the bottom surface of the cylindrical cap adjacent to the upper surface of the edge of the receptacle and the inner flange extending downwardly into the hollow area of the receptacle to prevent removal of the protective cover by sliding movement substantially parallel to the top surface thereof.

4,204,683

DEVICE AND METHOD FOR DETECTION OF THE SHOTS ON A TARGET FROM A DISTANCE

Gennaro Filippini, and Alfredo Filippini, both of Via di Jano n. 6, Bologna, Italy

Filed Mar. 31, 1977, Ser. No. 783,331
Claims priority, application Italy, Nov. 18, 1976, 3591 A/76
Int. Cl.[2] F41J *5/04*
U.S. Cl. 273—371 **4 Claims**



1. A system for detecting the shots of a shooter present on a solid, material target having a substantially flat surface from a distance, comprising

a solid stationary target having a substantially flat surface capable of being permanently marked,

a closed video circuit having only one video camera, a memory storage circuit and a television viewing monitor operatively connected together,

said camera being positioned adjacent to the target so as to receive light being influenced by a projectile about to hit the target,

said monitor being positioned adjacent the shooter and operatively connected to said camera so that the shooter can see an indication of the shot on the target via said monitor,

light source means for providing a track of light substantially defining a two dimensional area comprising parallel paths of light rays adjacent to, in parallel to and spaced in front of the target not impinging said flat surface thereof, said light source means comprises a rectangular member formed with a single elongated longitudinal slot, said track of light originating through said longitudinal slot,

said camera having an optical axis being positioned facing said track of light and said flat surface so as to receive light reflected by the projectile while crossing the track of light as the projectile is about to hit the target, said parallel paths of light rays extending non-parallel and substantially perpendicularly to said optical axis of said camera, whereby when the projectile crosses the track of light

before hitting the adjacent target a representation of the target impact site appears on the viewing monitor.

4. A method for detecting the shots of a shooter on a target from a distance, comprising the steps of

providing a planar track of light substantially defining a two dimensional area comprising parallel paths of light rays parallel to, spaced therefrom and adjacent in front of a substantially flat surface of the target without impinging on the target by passing light through a single elongated longitudinal slot in a rectangular member, the track of light originating through the longitudinal slot, and placing a system of Cartesian coordinates over the target by scanning lines, and scanning points within the lines,

disposing a video camera having an optical axis adjacent to and facing the target, said parallel paths of light rays extending non-parallel and substantially perpendicularly to said optical axis of said camera,

reflecting the light into the video camera by shooting at least one projectile toward the target crossing the track of light before hitting the target,

providing a video processing via a closed video circuit having only one video camera, a memory storage circuit and a television viewing monitor operatively connected together,

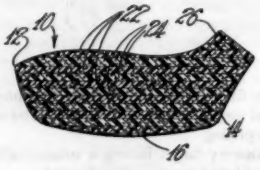
transmitting the reflected light from the camera onto the television monitor positioned adjacent the shooter, whereby when the projectile crosses the track of light before hitting the adjacent target a representation of the target impact site appears on the viewing monitor, so that the shooter can see an indication of the shot on the target.

4,204,684

GOLF CLUB HEAD AND METHOD OF PRODUCING SAME

Robert P. Molitor, South Hadley, Mass., assignor to Questor Corporation, Toledo, Ohio

Filed Oct. 31, 1977, Ser. No. 846,849
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—167 R **12 Claims**



1. A golf head comprising a laminated body wherein the laminations are solely of resinous materials, said body comprising a plurality of stacked laminations of resinous materials, the resin of certain of the laminations being unicellular and the resin of the remaining laminations being noncellular, said laminations being bonded together in the body.

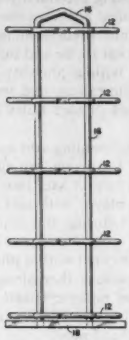
4,204,685

THREE DIMENSIONAL ALIGNMENT GAME

Clyde K. Jones, 211 Glenwood Ct., San Antonio, Tex. 78210

Filed Dec. 14, 1978, Ser. No. 969,321
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—241 **1 Claim**

1. An alignment game apparatus comprising an open framework structure including five vertically aligned, horizontally disposed playing surfaces, each surface comprising a wire configured to form a circular array of eight openings, each opening in each surface being of equal size and in vertical alignment with a corresponding opening in the surface immediately thereabove and/or therebelow, and a plurality of pegs in each of two differently colored sets, each peg being sized to be received in and supported by any of said openings, said pegs being alternately placed in said openings by opposing players in an effort to place five pegs of a single said surface, in vertical



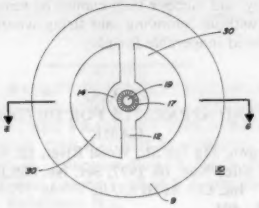
alignment, or in one step offset relation from surface to adjacent surface employing all five surfaces.

4,204,686

PHONOGRAPH RECORD PROTECTIVE CUSHION

Walter E. Church, 1108 Longmont Ave., Boise, Id. 83706

Filed Feb. 6, 1978, Ser. No. 875,247
Int. Cl.[2] G11B *23/00*
U.S. Cl. 274—1 R **1 Claim**



1. A protective cushion for label bearing phonograph records comprising:

a substantially planar annular ring having at least one rib extending between opposing internal edges of said ring defining a plurality of apertures for substantially unobstructed viewing of the labels, one of said ribs having a spindle receiving opening centrally located therein;

a multiplicity of flexible filamentous projections, horizontally disposed and radially and inwardly projecting from the edges of the spindle receiving opening, said projections defining a second spindle opening; and

cushioning material secured to opposing sides of said ring and said rib.

4,204,687

TONE ARM DRIVE DEVICE

Shizuo Inaba, and Yoshihisa Hirota, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,514
Claims priority, application Japan, Sep. 20, 1977, 52-112940
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **9 Claims**

1. A tone arm drive device comprising;

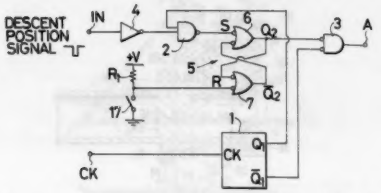
a reversible electric motor;

tone arm drive means responsive to said rotation of said motor to vertically move and horizontally swing a tone arm;

flip-flop means responsive to signals indicative of vertical movement of said tone arm, said vertical movement comprising elevation and descent of said tone arm, and generating an output in response thereto;

first logical gate means for generating an output of a logical product of a signal for descent of said tone arm and the output from said flip-flop means;

means for detecting an upward movement limit point of said tone arm and generating an output in response thereto;



a set-reset flip-flop receiving outputs from the first logical gate means and the detecting means and generating an output signal therefrom, the output from said first logical gate means being a set input and the output from the detecting means being a reset input to said set-reset flip-flop; and

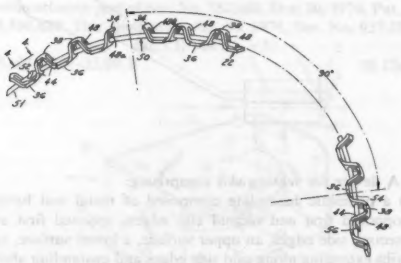
second logical gate means for generating logical product output of the output from said flip-flop means and the output signal from the set-reset type flip-flop and generating an output control signal, said output control signal employed to control vertical movement of said tone arm.

4,204,688

OIL CONTROL RING SPACER-EXPANDER WITH IMPROVED SLIP LATCH

M. Lewis Davis, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Sep. 8, 1976, Ser. No. 720,274
Int. Cl.² F16J *9/06, 9/12*
U.S. Cl. 277—9 **6 Claims**



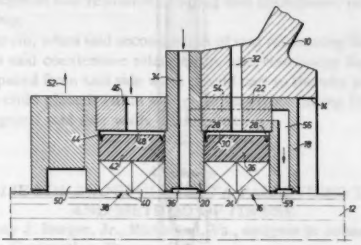
1. In combination with a corrugated circular spacer-expander for use in a piston oil control ring having a free-state radius of curvature and parted expander ends, and including a plurality of alternating concentric circumferentially spaced inner and outer crowns integrally interconnected by a plurality of generally diverging legs and oil drain openings formed one in each of said plurality of legs, and improved slip latch comprising a rod having one end extending through at least one leg opening adjacent one end of said spacer-expander and having a stop formed in said one end between spacer-expander legs and dimensioned in the axial direction to prevent passage of said stop through said leg openings, said stop having a dimension in the radial direction which is less than the corresponding radial dimension of said leg openings, said rod further having a second end extending through a plurality of leg openings in the opposing spacer-expander end, said second end being free to slide through said plurality of leg openings.

4,204,689

SEALING DEVICE FOR SHAFTS

Inge Johansson, Taby, Sweden, assignor to Defibrator Aktiebolag, Stockholm, Sweden

Filed May 1, 1978, Ser. No. 901,769
Claims priority, application Sweden, May 2, 1977, 7705092
Int. Cl.² F16J *15/40*
U.S. Cl. 277—27 **4 Claims**



1. In a sealing device for shafts passing through a wall separating media of different pressures, said sealing device including a packing box adapted to be mounted around a shaft, said packing box being mounted on a wall element, said packing box including a ring shaped chamber in which is disposed at least one layer of sealing material, the inner surface of said layer of sealing material being adjacent to the outer surface of said shaft,

the improvement comprising a cuff or sleeve mounted around the outer surface of said layer of sealing material, said cuff or sleeve being radially flexible and being formed from an elastic material, and first means for applying a pressurized medium to the outer surface of said cuff or sleeve so that the pressure exerted thereon is transmitted radially inwardly through said cuff or sleeve to said layer of sealing material, said transmitted pressure causing said layer of sealing material to be pressed in its entire axial extension against said shaft;

the entire inner surface of said layer of packing material being shaped to conform to the outer surface of said shaft so that said layer of sealing material is maintained in a flush, contiguously abutting relationship with the outer surface of said shaft; and

second means for applying a pressurized medium to the interface between the outer surface of said shaft and the inner surface of said layer of sealing material, said pressure applied by said second means being less than said pressure applied to the outer surface of said cuff or sleeve by said first means.

4,204,690

SEALING RETAINING RING ASSEMBLY

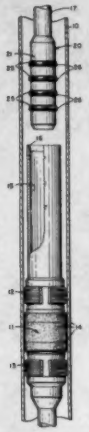
Warren E. Holland, Houston; James D. Burley, Humble, and Henry P. Arendt, Dallas, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Feb. 28, 1979, Ser. No. 16,223
Int. Cl.² F16J *15/40, 15/24*
U.S. Cl. 277—27 **6 Claims**

1. An assembly for sealing between two concentric cylindrical members comprising:

an annular groove formed on one of said cylindrical members, said groove containing seal material in contact with the surface of the other cylindrical member opposing said groove and an expansible-contractible split metallic retaining ring extending radially to the surface of said other cylindrical member and having at least a portion of the

surface on one side beveled inwardly to the inner edge of said retaining ring, the surface on the opposite side engaging one of the side walls of said groove, said retaining ring



being sized to elastically compress against the wall of said other cylindrical member to leave no gap between the outer edge of said retaining ring and the opposing wall of said other cylindrical member.

4,204,691

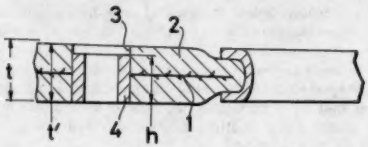
BREAK PREVENTING GASKET

Koyu Takase; Shigeo Makino, and Tadashi Naitou, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 17, 1978, Ser. No. 924,955

Int. Cl.[2] F16J *15/12*

U.S. Cl. 277—235 B **6 Claims**



1. A compressible, break-preventing gasket for use with the cylinder head cover of an internal combustion engine, comprising a rigid, metallic spacer member which is fitted into each through bore of said gasket for insertion of a head bolt, said spacer member having a height taken in the thickness direction of said gasket and which height is smaller than the gasket thickness that results when said gasket is compressed by normal fastening of said head bolt.

4,204,692

BLADE HOLDER FOR SABER SAW

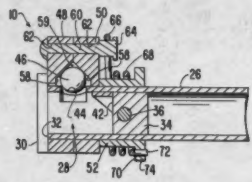
Simon J. Hoffman, P.O. Box 75821, Los Angeles, Calif. 90075

Filed May 2, 1978, Ser. No. 902,198

Int. Cl.[2] B23B *31/22*

U.S. Cl. 279—81 **1 Claim**

1. A holder for a saber saw blade of the type having a pair of opposed side marginal edges and a notch in one of the side marginal edges near the rear end of the blade comprising: a tubular support having an open end; a blade-mounting member inserted in the open end of the support and having a blade-receiving slot extending thereinto, the inner end of the member presenting a blade-engaging face and the side of the member having a recess communicating with the slot, said support having a hole communicating with the recess; means securing the member to the support; a ball movable partially into the hole, the recess and the slot; means including a pair of adjacent, interconnected cam elements rotatably mounted on the support for caging said ball so that the ball can move partially into and out of the notch of said saber saw blade when the blade is in said slot and as the ball extends at least partially through the hole and the recess, each element having a beveled, inner



peripheral face, the beveled faces being adjacent to each other to form a cam surface engagable with the ball to force the latter partially into said notch when said elements have been rotated in one direction on said support, said elements being rotatable on said support in the opposite direction to cause the cam surface to be positioned to allow movement of the ball away from the slot and thereby to permit the blade to be inserted into and removed from the slot; and means coupled with the elements for biasing the same in said one direction.

4,204,693

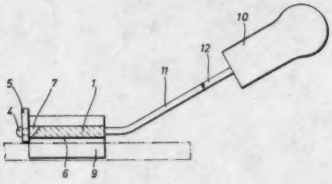
DEVICE FOR WAXING SKIS

Hans Å. Wicksell, Trestegsgatan 63, 603 63, Norrköping; Stig Ståhl, Jägmästargräand 4, 574 00, and Ingemar G. Löfstedt, Sjunnan, 574 00, both of Vetlanda, all of Sweden

Filed Apr. 5, 1978, Ser. No. 893,816

Int. Cl.[2] A63C *11/08*

U.S. Cl. 280—809 T **4 Claims**



1. A device for waxing skis comprising:

(a) a prismatic base-plate composed of metal and having opposed first and second end edges, opposed first and second side edges, an upper surface, a lower surface, and ribs extending along said side edges and upstanding above said upper surface;

(b) a handle projecting from said base-plate;

(c) an elongate metal end plate which is fitted to one end edge of the base-plate and which has an upper longitudinal edge protruding above said upper surface of the base-plate and a lower longitudinal edge protruding below said lower surface of said base-plate, said end plate together with said ribs and upper surface of the base-plate defining a recess for containing melted wax;

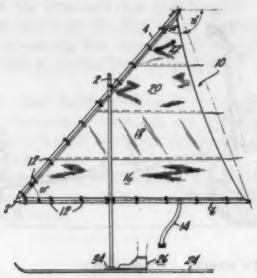
(d) aperture means extending through said base-plate between said upper and lower surfaces thereof adjacent said end plate for passage of said melted wax; and

(e) a guide member disposed along one side edge of the base-plate and protruding downwards below the lower surface thereof.

4,204,694
SAIL APPARATUS FOR A LAND VEHICLE

John L. Freeman, 1 West 67th St., New York, N.Y. 10023

Filed Jun. 22, 1978, Ser. No. 918,082
Int. Cl.[2] A63C 11/00
U.S. Cl. 280—810 24 Claims



1. Lateen sail apparatus for use in propelling a body member adapted to transport a user in a standing or crouching position over a solid surface, said apparatus comprising:

(a) a triangular-shaped sail;

(b) means including an upper spar and a lower boom for holding said sail in an open, triangular form;

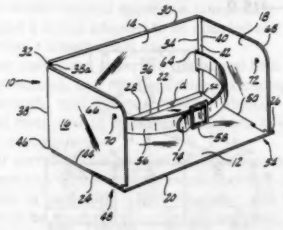
(c) a mast, connectable to said spar and said boom at positions substantially midway between the respective ends thereof, for supporting said holding means in a lateen configuration such that the sail area forward of the mast is a significant proportion of, but does not exceed the said area rearward of the mast; and

(d) means for detachably coupling said mast to the body member in such a manner that said mast may be articulated with respect to the body member throughout all vertical planes about said coupling means.

4,204,695
SHOPPING CART CHILD SEAT

Marilyn F. Salzman, 355 Dungate Dr., Chesterfield, Mo. 63017

Continuation-in-part of Ser. No. 752,065, Dec. 20, 1976, Pat. No. 4,108,489. This application Jul. 24, 1978, Ser. No. 927,219
Int. Cl.[2] A47D 1/10
U.S. Cl. 280—33.99 B 10 Claims



1. In combination, a shopping cart having a child seat structure including a horizontal platform extending along the entire width of said cart between two vertical side walls of said cart; and

a child seat fitted within said child seat structure, said child seat comprising:

a first panel having first and second side edges and first and second end edges;

a second panel having third and fourth side edges and third and fourth end edges;

said first panel having said second side edge thereof coextensive with and hinged to said third side edge of said second panel;

said first, second, third and fourth side edges being shorter than the length of said platform;

first and second restraining flaps, each having a first edge coextensive with and hinged to a respective one of said first and second end edges of said first panel, each of said restraining flaps having a second edge adjoining a respective one of said first edges of said flaps and movable into coextensive relationship with a respective one of said third and fourth end edges of said second panel; and

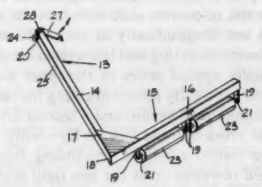
securing means for releaseably securing each of said second edges of said restraining flaps in said coextensive relationship;

wherein, when said second edges of said restraining flaps are in said coextensive relationship, said restraining flaps are spaced from said side walls of said cart to thereby prevent a child placed within said child seat from falling laterally against said side walls of said cart.

4,204,696
DOLLIE FOR MANIPULATING A PALLETIZED LOAD AND METHOD OF ITS USE

Anthony J. Burger, Jr., Richmond, Va., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 20, 1978, Ser. No. 897,992
Int. Cl.[2] B62B 11/00
U.S. Cl. 280—79.1 R 10 Claims



1. Apparatus for supporting a load of material so that it can be readily raised and moved over a generally flat surface, said material being arranged on a pallet, said pallet being supported by a plurality of legs to provide an undersurface spaced a distance from said flat surface, said apparatus comprising an L-shaped right-handed and left-handed dollie, each dollie, comprising:

a lever extending in a longitudinal direction,

support means affixed to one end portion of said lever, said support means extending in a longitudinal direction which is perpendicular to the longitudinal direction of said lever, said lever and said support means lying generally between two parallel planes,

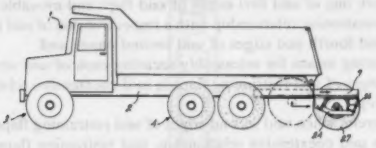
rolling means attached to said support means, said rolling means extending from one longitudinal side of said support means in a direction which is perpendicular to said parallel planes and being mounted to rotate around a fixed axis which is parallel to the longitudinal direction of said support means, the vertical displacement of said rolling means and support means being less than said distance when said lever is in a generally vertical position and when said lever is rotated to a generally horizontal position and said rolling means and support means are disposed under said pallet, the vertical displacement of said rolling means and support means being greater than said distance so that said support means engages said pallet undersurface and said rolling means engages said flat surface whereby the legs of said pallet are lifted off said flat surface and said load is supported and may be transported over said flat surface, and means for retaining said lever in a horizontal position.

4,204,697

VARIABLE WHEELBASE ROAD TRUCK

David Santerre, 13 Brunet St., Pointe-des-Cascades, Canada

Filed Oct. 27, 1978, Ser. No. 955,388
Int. Cl.[2] B62D *33/08*
U.S. Cl. 280—80 B 2 Claims



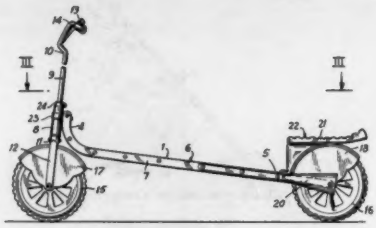
1. A variable wheelbase truck comprising an elongated, rigid chassis including a pair of spaced parallel channel-shaped longitudinal beams, each having a front end and a rear end, cross beams rigidly interconnecting said longitudinal beams, one of said cross beams, being the rearmost cross beams, rigidly interconnecting the rear ends of said longitudinal beams and including a central upwardly convex portion defining a central recess at its underside, elongated slide members secured within and extending longitudinally of said longitudinal beams and terminating at the rear end of the latter, a movable frame including a pair of spaced-apart longitudinal beams slidably fitted within the respective slide members for slidable movement within and longitudinally of said slide members, cross bars rigidly interconnecting said last-named longitudinal beams at longitudinally spaced zones of the latter and including a rearmost cross bar rigidly interconnecting the rear ends of said last-named longitudinal beams, and a second cross bar next to said rearmost cross bar and spaced forwardly thereof along said movable frame, a tongue upstanding from the central portion of said rearmost cross bar and rigid therewith, a double-acting cylinder and piston unit extending longitudinally of said chassis and frame along the center line thereof and with the cylinder of said unit pivotally attached to one of said cross beams and extending across said recess and underneath said rearmost cross beam, and with the rear end of the piston rod of said unit extending above the level of the rearmost cross bar and pivotally attached to said tongue, a bracket rigidly fixed under each longitudinal beams of said movable frame and under said second cross bar, a lever arm extending longitudinally of the truck, pivoted to said bracket at its front end, an adjustable pressure air suspension bag extending between and connected to the rear end of said lever arm and to the underside of the rear ends of the longitudinal beams of said movable frame and underneath said rearmost cross bar, a rear wheel and axle assembly secured at a fixed position to and underneath the longitudinal beams of said chassis and spaced forwardly from the rear ends of said longitudinal beams of said chassis, a supplementary wheel and axle assembly secured to said lever arms intermediate the ends thereof, said movable frame, upon action of said cylinder and piston unit, moving between an extended position in which said brackets and said supplementary wheel and axle assembly are located rearwardly of said rearmost cross beam, and a retracted position in which said rearmost cross bar lies directly underneath said rearmost cross beam and said movable frame, rearmost cross bar, air suspension bags and supplementary wheel and axle assembly do not protrude rearwardly of the rearmost cross beam and of the rear ends of the longitudinal beams of said chassis, the wheels of said rear wheel and axle assembly being disposed sufficiently forwardly of the rearmost cross beam to clear the wheels of the supplementary wheel and axle assembly in the retracted position of said movable frame.

4,204,698

CHILD'S SCOOTER

Nicholas Mihalik, 98-25 65th Rd., Forest Hills, N.Y. 11374

Filed Nov. 17, 1978, Ser. No. 961,713
Int. Cl.[2] B62K *9/00*
U.S. Cl. 280—87.04 R 5 Claims



1. A child's scooter, comprising

a carriage having an elongated platform for supporting a foot of a user, said platform being substantially planar with a front and a spaced rear and curving upward in the area of the front thereof to approximately 90° with the remainder of said platform, a cover of high friction material on the platform to prevent slippage of the foot and a frame extending around the front and sides of the platform;

a collar;

a tubular member surrounded by said collar and affixed to the frame via said collar at the front of the platform, said tubular member extending substantially parallel to said front and substantially perpendicular to the remainder of said platform;

a steering shaft rotatably mounted in the tubular member and having spaced opposite top and bottom ends;

a forked part extending substantially colinearly from the bottom end of the steering shaft;

handlebars extending from the top end of said steering shaft;

a front wheel rotatably mounted in the forked part; and

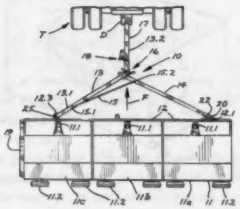
a rear wheel rotatably mounted at the rear of said platform.

4,204,699

HITCH FOR DRAFT IMPLEMENT

Wayne Gustafson, Erskine, Minn., assignor to Erskine Manufacturing Company, Inc., Erskine, Minn.

Filed Nov. 17, 1978, Ser. No. 961,738
Int. Cl.[2] B62D *53/00*
U.S. Cl. 280—415 R 12 Claims



12. A hitch for connecting a tractor with an elongate drawbar to an elongate field implement having an evener at an elongate forward side of the implement and also having a leading end adjacent one end of the evener, comprising

a rigid elongate draft frame having a forward end with means for attachment to the tractor drawbar and also having a rear end with means for pivotal connection to said one end of the implement evener for swinging between a field position wherein the draft frame extends

generally forwardly of the implement and a transport position wherein the draft frame extends generally longitudinally of the elongate field implement and evener and from said leading end of the implement,

a brace extending obliquely from the draft frame for connection with the evener of the implement, a first latch means detachably connecting the brace with the draft frame intermediate the front and rear ends thereof,

the attachment means of the draft frame including an elongate rigid connecting link swingable from side to side as the draft frame is moved from field position to transport position,

a second latch means between the connecting link and draft frame and alternately connecting the connecting link in alternate positions after swinging side to side with respect to the draft frame, and

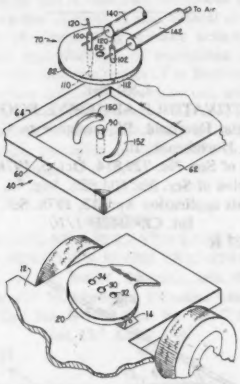
a second brace means interconnecting the draft frame with the leading end of the implement when the draft frame is in transport position.

4,204,700

ANTI-JACKKNIFE APPARATUS

Joseph R. Haines, Sr., Bordentown, N.J., assignor to Haines Towing Inc., Bordentown, N.J.

Filed Nov. 8, 1978, Ser. No. 958,881
Int. Cl.[2] B62D *53/08*
U.S. Cl. 280—432 **5 Claims**



1. Tractor-trailer control apparatus comprising

a tractor and a trailer adapted to be coupled and decoupled, and having a longitudinal axis,

said tractor carrying a generally horizontal fifth wheel having first, second, and third apertures extending vertically therethrough, said apertures being aligned on an axis oriented transverse to the longitudinal axis of said tractor-trailer combination,

said trailer carrying a kingpin for insertion into the second of said apertures which is the central aperture of the three apertures in said fifth wheel whereby said tractor and trailer can be mechanically coupled together,

a pair of penumatic cylinders secured to said trailer and oriented generally parallel to said longitudinal axis, each cylinder having an operating piston, one piston being aligned with said first aperture and one piston being aligned with said third aperture,

coupling means secured to each of said pistons and positioned for removable insertion in said other two apertures in said fifth wheel whereby said pneumatic cylinders can be rigidly connected to or disconnected from said fifth wheel, whereby rotation of said fifth wheel transmits motion through said coupling means and said pistons to said pneumatic cylinders which in turn oppose the rotation of said fifth wheel and of said trailer with respect to said tractor, and

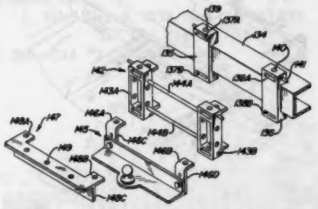
a controllable source of air coupled to said pneumatic cylinders to adjust the degree of resistance of said cylinders to rotation of said fifth wheel and to relative movement between said tractor and trailer.

4,204,701

UNIVERSAL QUICK DETACH ACCESSORY MOUNT FOR VEHICLES OR THE LIKE

Victor C. Oltrogge, 6054 Queen Ct., Arvada, Colo. 80004

Division of Ser. No. 654,364, Feb. 2, 1976, abandoned. This application Aug. 23, 1978, Ser. No. 935,929
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—491 E **14 Claims**



1. In a bumper hitch system for releasably attaching accessories to the bumper of a vehicle, a mounting frame assembly rigidly attached to the bumper and including a plurality of narrow slotted passageways opening thereinto defined by sidewalls of a rectangular cross-section, said mounting frame assembly having bores extending through the longer sidewalls, said mounting frame assembly retaining said passageways in a generally rectangular configuration in which said passageways are located at the four corners of the rectangle, an adapter comprising a plurality of prongs each having a wide, flat rectangular cross-section sized for close fitting insertion within said slotted passageways and a hole in proximity to one end of each prong with said hole extending therethrough across the narrower dimension of the rectangular cross-section for aligning with the sidewall bores, means for attaching an accessory to the other end of said prongs, and releasable attachment means extending through the aligned said hole and said bores of the mounting frame assembly for releasably retaining each said prong against removal from the associated said passageway.

4,204,702

UNIVERSAL QUICK DETACH ACCESSORY MOUNT FOR VEHICLES OR THE LIKE

Victor C. Oltrogge, 6054 Queen Ct., Arvada, Colo. 80004

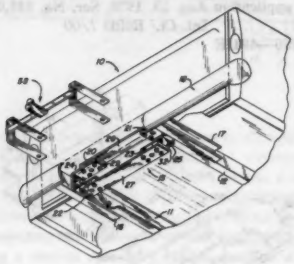
Continuation of Ser. No. 654,364, Feb. 2, 1976, abandoned. This application Aug. 23, 1978, Ser. No. 935,990
Int. Cl.[2] B60D *1/06*
U.S. Cl. 280—491 E **12 Claims**

1. Hitch apparatus adapted for removable mounting an article to be towed to the underframe of a vehicle and the like, comprising:

a male adapter affixed to said article, said male adapter including a plurality of interconnected arms projecting in a common direction in spaced substantially parallel relation to one another and each arm terminating in a solid flat tongue portion at its outer free end, said arms being connected at the other end in rigid relation to one another and at least two of said arms being in substantially vertical orientation to one another;

a pair of rigid brackets mounted to said underframe and projecting outwardly thereform in spaced-apart relation to one another;

female interconnecting means mounted on said rigid brackets for interconnecting said male adapter to said underframe, said female interconnecting means having upper and lower substantially horizontal slotted passageways aligned for simultaneously receiving the tongue portions of said arms in mating relation to one another, each of said slotted passageways having upper and lower walls spaced apart a distance for close-fitting insertion of its respective tongue portion and elongated in the direction of insertion of said tongue portion thereinto, said female interconnecting means having a pair of elongated parallel spaced-apart



wall portions attached to said brackets and each said wall portion defining one of said upper and lower walls of each said slotted passageway; and

releasable attachment means for positively coupling said arms within said slotted passageways, said releasable attachment means extending through slotted passageways in a direction transversely of the direction of extension of said arms into said slotted passageways and extending through openings in said arms so as to be operative when attached to transfer the load forces between said adapter and said female interconnecting means to said underframe.

4,204,703

DEVICE FOR STARTING AIR BAG DEVICES

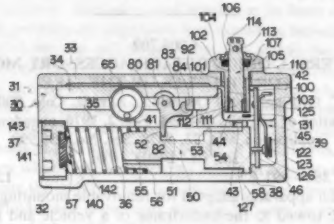
Motohiro Okada, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1978, Ser. No. 871,838

Claims priority, application Japan, Jan. 31, 1977, 52/9519

Int. Cl.[2] B60R *21/08*

U.S. Cl. 280—734 **5 Claims**



1. An automobile air bag device starting apparatus, comprising:

a cylinder;

a weight slidably disposed within said cylinder;

a spring provided within said cylinder resiliently pressing said weight rearwardly into an initial normal position under a pre-set spring load;

said weight being provided with a recess in the lengthwise direction thereof on the outer periphery of said weight;

air bag starting means;

a link mechanism adapted to be collapsed to thereby actuate said air bag starting means;

a substantially L-shaped arm pivotably mounted on said cyliner, one end of said arm entering said recess and the other end of said arm being engaged with said link mechanism;

said arm being in contact at said one end thereof with the forward end of said recess of said weight when said weight is resiliently pressed in said normal position;

said weight being adapted to move forwardly from said normal position when a force above said pre-set spring load of said spring acts on said weight at the time of a collision;

said arm being urged to rotate by the rearward end of said weight when said weight is moved forwardly, to therebe collapse said link mechanism to actuate said air bag starting means;

a plug, said plug being adapted to close the front end of said cylinder;

a sucking disc provided at a forward moving limit of said weight at an inner end of said plug, opposite the front end surface of said weight; and

said sucking disc being adapted to apply a sucking force to said weight when said weight reaches the forward moving limit thereof.

4,204,704

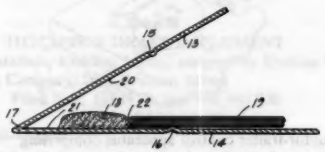
HEAT REACTIVATIBLE ADHESIVE BOOK BINDING

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Continuation of Ser. No. 729,814, Oct. 5, 1976, abandoned, which is a division of Ser. No. 604,659, Aug. 14, 1975, Pat. No. 3,995,886. This application Apr. 13, 1978, Ser. No. 896,027

Int. Cl.[2] B42D *1/10*

U.S. Cl. 281—21 R **2 Claims**



1. A book cover for binding a plurality of paper sheets having ends positioned adjacent and parallel to but not in contact with a center fold of the bound book, comprising:

a) a cover having two leaves with substantially equal surface dimensions and joined at a center fold;

b) each leaf having a leaf score spaced from and parallel to the center fold;

c) a strip of hot melt adhesive longitudinally extending parallel with the center fold and deposited on a flat portion of one of said leaves between the center fold and score, the strip being spaced from the center fold and leaf score by first and second uncovered areas respectively;

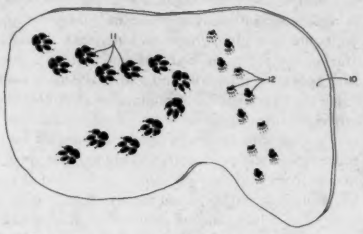
d) the strip including a paper sheet abutment wall means facing outwardly with respect to the center fold and at a substantial angle with respect to said flat portion, said abutment wall providing an alignment surface and engaging surface for the paper sheets; and

e) only one of said two leaves having the strip deposited thereon.

4,204,705
ANIMAL TRACK TEACHING

William J. J. Gordon, and Anthony N. Poze, both of 121 Brattle St., both of Cambridge, Mass. 02138

Filed Nov. 21, 1977, Ser. No. 853,453
Int. Cl.[2] B42D 15/00; G09F 7/00
U.S. Cl. 283—1 R 7 Claims



1. An animal track teaching unit comprising,

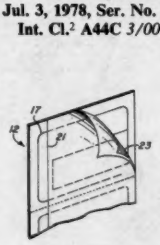
means defining a surface having artificially established full-size reproduction of nonhuman animal tracks of at least two nonhuman animals which reproductions are adapted to be placed in a natural environment selected, oriented and spaced when on said surface to correspond to the tracks made by said at least two nonhuman animals pursuing an interactive activity in said natural environment.

7. A method of representing wildlife activity comprising locating full-size reproductions of nonhuman animal tracks representing in full scale the tracks of at least two nonhuman animals on a surface suitable for outdoor use, and placing said surface in a natural outdoor setting so that said full-size reproductions correspond to the tracks made by said at least two nonhuman animals pursuing an interactive activity in said natural outdoor setting.

4,204,706
METHOD AND MULTI-LAYER LABEL HAVING PRESSURE-SENSITIVE MARK TRANSFER SYSTEM

Julian J. Blum, 7211 N. 3rd St., Phoenix, Ariz. 85020, and Don J. W. Thralls, 336 W. Gardenia, Phoenix, Ariz. 85021

Filed Jul. 3, 1978, Ser. No. 921,726
Int. Cl.[2] A44C 3/00
U.S. Cl. 283—21 8 Claims



1. A multi-layer label system comprising in combination:

(a) a transparent cover sheet having an inside surface and an outside surface, and having a pressure-sensitive adhesive on said inside surface;

(b) a removable separator sheet releasably contacting said pressure-sensitive adhesive on said inside surface of said transparent cover sheet;

(c) a label having an information surface facing said separator sheet and a back surface having a pressure-sensitive adhesive thereon;

(d) a removable back sheet releasably adhering to the pressure-sensitive adhesive on said back surface of said label;

(e) pressure-sensitive marking means disposed on said separator sheet for producing marks on said information surface in response to marking pressure applied to the outside surface of said transparent cover sheet; and

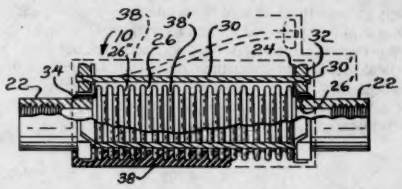
(f) said transparent cover sheet being releasably secured along one edge thereof to said back sheet, said transparent cover sheet being secured to said label along an edge thereof adjacent to said edge of said transparent cover sheet;

whereby said information surface can be effectively marked without folding back said transparent cover sheet and said pressure-sensitive means from said information surface of said label.

4,204,707
VIBRATION ABSORBING CONNECTOR

Thomas N. Lincicome, Elgin; John M. Spiro, Dundee, and Albert J. Brons, Villa Park, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 8, 1978, Ser. No. 967,813
Int. Cl.[2] F16L 51/02
U.S. Cl. 285—114 2 Claims



1. A connector for isolating high pressure fluid piping systems from vibration comprising a corrugated thin metal bellows member having a central corrugated section of a wall thickness no greater than about 0.006" and of an insufficient thickness if subjected to system maximum design pressures to resist permanent deformation, and integral opposed uncorrugated end portions adapted to be attached to spaced portions of an associated piping system; a pair of end plate members, each of said end plate members having a central aperture therein through which one of said end portions passes and an annular planar surface positioned in a plane perpendicular to the axis of the bellows member, said planar surfaces contacting the axially outermost corrugations in said central corrugated section and being integrally affixed to said uncorrugated end portions; tie means anchored to each of said end plate members at least three circumferentially spaced points for resisting axial separation of said end plate members and axial elongation of said central corrugated section while permitting lateral movement of the spaced portions of the associated piping system relative to each other, integral elastomeric means surrounding said connector and encapsulating said tie means, said elastomeric means including at least a first elastomeric portion of a durometer in the range of about 40–70, Shore A filling the spaces between the outward facing corrugations in the central corrugated section, said elastomeric portion having sufficient rigidity to limit deformation of the corrugations under operating conditions to an amount which will not degrade their ability to continue to absorb vibratory motions.

4,204,708
DOOR LATCH ASSEMBLY

Harold W. Carlson, 15833 W. 11 Mile Rd., Apt. 105, Southfield, Mich. 48073

Filed Nov. 17, 1978, Ser. No. 961,698
Int. Cl.[2] E05C 3/04
U.S. Cl. 292—292 4 Claims

1. A door latch assembly comprising a thin flat latch plate and a latch bar member, said flat latch plate having a plurality of perforations in it adapted to receive fasteners whereby the

plate may be secured to a door jamb in the clearance space between the jamb and the edge of a hinged door, said latch plate having a lip adapted to project into a room where the plate is mounted on the door jamb of a doorway to the room, said lip having a plurality of openings vertically spaced from each other and having inside vertical edges adapted to be located adjacent the inside surface of said door when the door is closed, said latch bar having a plurality of arms projecting

transversely to the length of the bar, said arms being sized to freely project through said latch openings whereby said latch bar is supported on said lip and overlaps said door to act as a stop preventing opening of the door, said latch bar arms having vertical recesses adjacent their inner ends adapted to fit over the bottom edges of said latch openings whereby a vertical component of motion is needed to unseat the latch bar from the latch plate.

4,204,709

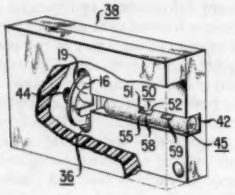
SEAL FOR A PUBLIC PAY TELEPHONE STATION COIN BOX

Frank J. Shea, 258 E. Shore Trail, Sparta, N.J. 07871

Filed Mar. 9, 1978, Ser. No. 884,889

Int. Cl.[2] B65D *33/34*

U.S. Cl. 292—307 R **36 Claims**



1. A seal for a hasp attaching a removable cover to a coin box to enclose the interior thereof and including a staple provided with a closed free end encircling open space interiorly thereof, said box mounted in coin activated vending apparatus for collecting coins deposited into said apparatus and serving thereupon to activate said apparatus into a vending state, comprising:

transparent means embodying an aperture coincident with an area of minimum dimension of said means and disposed to receive said staple end therein for mounting said means on said latter end while at the same time registering said staple end open space with said aperture, said means also embodying a hole coincident with an area of maximum dimension thereof; said areas of minimum and maximum dimensions being mutally perpendicularly disposed for registering said hole with said registered aperture and staple end open space and for extending said hole through said aperture and staple end open space to dispose a closed end of said hole on corresponding one sides of said respective aperture and staple end and an open end of said hole on corresponding opposite sides of said respective aperture and staple end; and

plunger means initially located in a first position in said transparent means hole via said open end therein in which position both said inner and outer ends of said plunger means are located on said opposite sides of said aperture and staple end as visible in said transparent means when said transparent means is mounted on said staple end for indicating a nonlocking state of said latter means;

thereafter said plunger means further located in a second position in said hole via said open end thereof as said hole is registered with said aperture and staple end open space to locate said plunger means inner end as visible in said transparent means on said corresponding one sides of both said aperture and staple end and at the same time to continue the location of said plunger means outer end on said corresponding opposite sides of both said aperture and staple end; said last-mentioned locations of said plunger means inner and outer ends serving to change said plunger means from said first position to said second position in said hole in said transparent means for indicating a locking state of said latter means mounted on said staple end;

said second position of said plunger means in said hole in said transparent means mounted on said staple end together with said last-mentioned means constituting said seal for said hasp to impede pilfering said coins from said box.

4,204,710

RESCUE NET

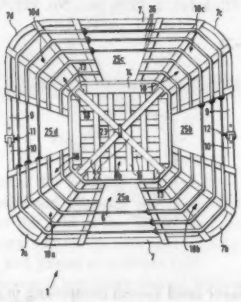
Günther Rothaemel, Witten, and Gerd Fengels, Hagen, both of Fed. Rep. of Germany, assignors to Bruggemann & Brand KG, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,240

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1977, 2735656

Int. Cl.[2] B66C *1/12*

U.S. Cl. 294—77 **17 Claims**

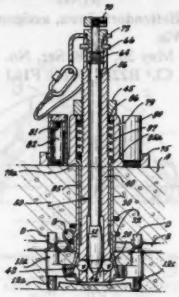


1. A cage-like rescue net attachable to a helicopter and the like comprising: a bottom portion defining a floor for persons or articles to be rescued; and an outer net-like peripheral wall attached to said bottom portion and defining at least one access opening; said bottom portion comprising two halves pivotable one towards the other about a common axis to an open position in which said two halves are pivoted outwardly away from one another to form said floor during use of the rescue net and to a closed position in which said two halves are pivoted inwardly towards one another and upwardly towards said peripheral wall to effectively enclose and stow the remaining portions of the rescue net during non-use of the rescue net.

4,204,711
COUPLING FOR LIFT SYSTEM FOR CONCRETE SLABS

Harry B. Lancelot, III, and Robert M. Macrobbie, both of Fort Worth, Tex., assignors to Brown Company, Pasadena, Calif.

Filed Jul. 20, 1978, Ser. No. 926,286
Int. Cl.[2] B66C *1/00*
U.S. Cl. 294—89 23 Claims



1. A coupling for selectively effecting a releasable connection to a concrete slab having an opening, comprising:

a tubular element in said opening having a frustoconically flared portion facing the interior of the slab, further having a cylindrical neck portion extending from a smallest diameter portion of the flared portion;

a base embedded in the slab, including means for positioning the tubular element, the tubular element being surrounded by concrete in the slab and in engagement with a correspondingly flared portion of the opening in the slab, for retaining the tubular element in the concrete;

a casement of elongated tubular construction having a front end and a rear end, there being a plurality of laterally extending openings in the casement;

a plurality of freely inwardly and partially radially outwardly displaceable balls in the openings;

a plunger with a head and a conical tip in the casement being axially moveable therein, the plunger upon being partially retracted in the casement permitting the balls to retract into the opening, at least sufficiently far enough so that the casement can clear said neck portion, the plunger upon advancing having its tip radially displacing the balls for protraction, the head holding the balls in protracting position; and

releasable means, accessible near the rear end of the casement for retaining the plunger and the head in the advanced position.

4,204,712
VEHICLE DECKING BEARER

Alexander Maricic, Newcastle, Australia, assignor to John Lysaght (Australia) Limited, Sydney, Australia

Filed Aug. 22, 1978, Ser. No. 935,813
Claims priority, application Australia, Aug. 29, 1977, PD1429
Int. Cl.[2] B62D *33/00*
U.S. Cl. 296—35.1 7 Claims

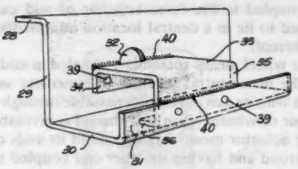
1. A bearer for use in a vehicle of the kind wherein a decking is supported on a pair of said bearers which in turn respectively rest upon and are parallel to a pair of chassis members forming a part of the vehicle structure and extending longitudinally, comprising

a Z-section runner having:

a. An upright web, having selectively longitudinally spaced bolt holes at locations in a neutral axis of said runner,

b. A top horizontal flange extending from the top longitudinal edge of said upright web, for orientation outward of said vehicle,

c. A bottom horizontal flange extending from the bottom longitudinal edge of said upright web for orientation inward of said vehicle,



d. A bridge member fixed to the inner side of said upright web and over said bottom horizontal flange having a flat U-bolt bearing surface, the plane of which rectangularly intersects said bolt hole in said upright web.

4,204,713
MEANS FOR ATTACHING A COVER TO A BICYCLE SADDLE

George W. Worley, Bolivar, Tenn., assignor to Troxel Manufacturing Company, Moscow, Tenn.

Filed Jan. 12, 1979, Ser. No. 3,488
Int. Cl.[2] B62J *1/18*
U.S. Cl. 297—214 8 Claims

1. In combination with a plastic bicycle saddle of the type wherein a saddle base having a downwardly extending flange along the entire periphery thereof is provided, and a saddle cover furnished with inwardly directed flap means along the entire periphery thereof for being folded over the flange of said base thus contiguously engaging the flange of said base, the improvement which comprises attachment means for removably attaching said cover to said saddle base, said attachment means comprising prong means fixedly attached to said saddle base being disposed a predetermined spaced distance inwardly of said flange for cooperating therewith in defining a narrow channel into which said flap means is snugly received, said saddle cover being molded from a substance having characteristics wherein said flap means remains somewhat inherently resilient and flexible while the thickness of at least said flap means is sufficient so as to impart a degree of yieldable stiffness thereto, thus contributing significantly to the effectiveness of said attachment means.

4,204,714
PAVEMENT CUTTING MACHINE WITH PAD TO STABILIZE AND BRAKE MACHINE

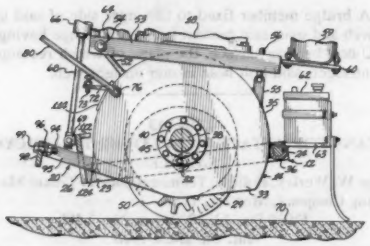
Carl C. Jacobson, Tempe, and Gaius P. Crosby, Mesa, both of Ariz., assignors to Crafco, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 894,923, Apr. 10, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,367
Int. Cl.[2] E01C *23/09*
U.S. Cl. 299—1 9 Claims

1. A pavement cutting machine comprising:

(a) a carriage of open configuration having a pair of spaced side rails, a rear crossrail and a front crossbar;

(b) a pair of axially aligned wheels each attached to a different one of the side rails of said carriage intermediate the front and rear ends thereof;
(c) a downwardly opening shroud having its front end pivotably coupled to the front crossbar of said carriage and disposed to lie in a central location intermediate the side rails thereof;
(d) cutter wheel means rotatably journaled in said shroud so as to lie in a central location intermediate said pair of wheels with its axis of rotation passable through the axis of said pair of wheels when said shroud is pivotably moved;
(e) linear actuator means having one of its ends coupled to said shroud and having its other end coupled to the rear



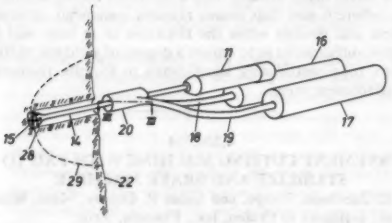
crossrail of said carriage and actuatable for pivotably moving said shroud to lower said cutter wheel means into a pavement cutting position below said carriage;
(f) an engine mounted on top of said shroud for movement therewith;
(g) drive means connected between said engine and said cutter wheel means for rotational driving thereof; and
(h) stabilizing and brake means mounted on said shroud for movement therewith and extending from said shroud, said stabilizing and brake means movable into and out of bearing engagement with the surface of the pavement being cut upon rotation of said carriage about the axis of said pair of wheels.

4,204,715

METHOD AND DEVICE FOR BREAKING A HARD COMPACT MATERIAL

Erik V. Lavon, Saltsjö-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 17, 1977, Ser. No. 852,576
Claims priority, application Sweden, Nov. 24, 1976, 7613107
The portion of the term of this patent subsequent to Jan. 11, 1995, has been disclaimed.
Int. Cl.[2] E21C *37/12*
U.S. Cl. 299—16 **70 Claims**



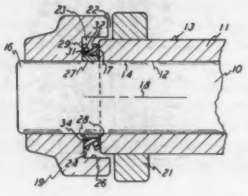
34. A method of breaking hard compact material, such as rock, by means of relatively incompressible fluid, such as water, comprising: drilling a hole in the material to be broken with a drill rod and drill bit, retaining the drill rod and drill bit in the drilled hole, accelerating a longish fluid mass body to a velocity of sufficient magnitude for generating a momentum required for breakage, and directing said longish fluid mass body into said hole around said drill rod to impact a surface in the hole to create pressure for breaking the material.

4,204,716

TRACK JOINT WITH A THRUST RING AND A SEAL RING

John M. Baylor, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed May 30, 1978, Ser. No. 910,202
Int. Cl.[2] B22D *55/00*; F16J *15/38*
U.S. Cl. 305—11 **5 Claims**



1. A track joint with a thrust ring and a seal ring, comprising a track pin, a cylindrical bushing on said pin and terminating in an annular surface disposed on a plane transverse to the extent of and within the length of said pin, a track link on the end of said pin and having an annular surface, said annular surfaces being spaced apart and faced toward each other and extending radially from and beyond said pin on respective planes transverse to the longitudinal axis of said pin, a thrust ring of rigid material fitted on said pin between and in abutting contact with said annular surfaces at the radially inward portions of said annular surfaces for maintaining said bushing and said link spaced apart, and an elastomer seal ring extending around said thrust ring in snug endless circular contact therewith and radially outwardly therefrom and being disposed completely in the space between said annular surfaces, mated projections and notches on said thrust ring and said seal ring at the snug contact therebetween, for securing said seal ring on said thrust ring, said seal ring having an annnular body portion and two radially outwardly extending legs having a radial extent less than that of said annular surfaces to be disposed within the radial limits of said annular surfaces, said legs having circular edges at the axially opposite ends of said seal ring and with said circular edges being in respective compressed contact with said annular surfaces for sealing therewith, said circular edges being spaced radially inwardly from the radial outer limit of said seal ring and being disposed on respective planes beyond the planes of the axial ends of said thrust ring, in the free body condition of said seal ring, for effecting the compressed contact with said annular surfaces.

4,204,717

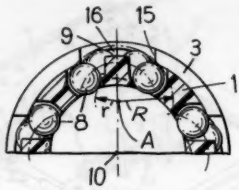
BALL BEARING WITH RADIAL APERTURES IN END RINGS

Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,927
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725355
Int. Cl.[2] F16C *31/06*
U.S. Cl. 308—6 C **7 Claims**

1. In a linear motion ball bearing for movement along a shaft, the bearing including an outer sleeve with races extending axially in the bore, a cylindrical ball guide within the outer sleeve, a plurality of endless raceways at least partially defined

by said sleeve and ball guide and substantially filled with balls, each endless raceway including a pair of axial loaded and non-loaded return zones and curved turn-around zones connecting the ends of the axial zones, and end rings secured at the ends of the sleeve and ball guide and overlying the turn-around zones, the improvement in combination therewith, wherein each turn-around zone is defined by a convex surface of the ball guide extending radially outward, and a corresponding



concave surface of said end ring spaced radially outward of said convex surface, said convex and concave surfaces having radii of curvature whose centers lie on a common center-point axis extending parallel to the axis of the bearing, and wherein each of said end rings includes radially extending apertures therethrough, each aperture defined by edges which at least partially overlie one of said turn-around zones and which prevent balls from falling out of said turnaround zones.

4,204,718

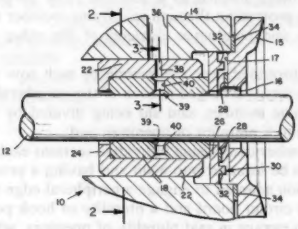
BEARING ASSEMBLY

Armand Bosco, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 11, 1978, Ser. No. 968,646

Int. Cl.[2] F16C *35/02*

U.S. Cl. 308—15 **18 Claims**



1. A bearing assembly for supporting a relatively high speed rotating shaft with respect to a housing comprising a sleeve bearing rotationally received over the shaft; a bearing carrier mounted within a passage formed in the housing and rotationally receiving said sleeve, said carrier having an inwardly radiating thrust face at one end forming an axial stop for bearing engagement with one end of said bearing; an annular retainer received over the shaft for bearingly engaging the other end of said bearing; a radially inwardly projecting housing shoulder portion adjacent said retainer and axially movable with respect to the housing; spring means interposed between said retainer and said shoulder portion for axially spacing said retainer from said shoulder portion and for biasing said retainer into circumferentially uniform frictional engagement with said bearing to limit axial and rotational freedom of said bearing; and means for closely predetermining the axial position of said shoulder portion with respect to the housing, and thereby also predetermine the axial spacing between said retainer and said shoulder portion.

4,204,719

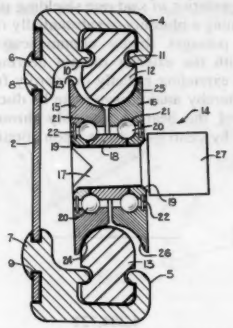
BEARING AND SUPPORT

Raymond J. Murphy, Rte. 2, Bonne Terre, Mo. 63020

Filed Oct. 17, 1977, Ser. No. 842,532

Int. Cl.[2] F16C *19/18*; A63B *69/00*

U.S. Cl. 308—188 **5 Claims**



1. A bearing for use in combination with a pair of parallel disposed races with said bearing being located for freely riding between such races, comprising, a pair of parallel disposed races, a pair of rotatable members, said pair of members being rotatable about an axis, a shaft having these members rotatably mounted thereon and providing a common axis about which said members rotate, each member having a concaved outer surface extending around its circumference and with said surfaces being arranged substantially directed towards each other whereby each said surface may ride on a separate race and attain simultaneous and opposite rotation, said bearing being of the counter-rotating type wherein one rotatable member is capable of turning in one direction upon one race with the other rotatable member being capable of simultaneously turning in the opposite direction upon the other and parallel race, bearing means arranged intermediate the rotatable members and their shaft to facilitate turning said members therearound, each rotatable member including formed inner and outer surfaces, the inner surface being contoured to cooperate with a plurality of said bearing means to facilitate the rotation of each member with respect to the shaft, and the outer surface of each rotatable member being contoured in concavity to undertake a bearing relationship during functioning of the invention.

4,204,720

CLUTCH RELEASE BEARING ASSEMBLY

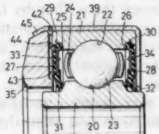
Hisao Otani, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 24, 1978, Ser. No. 927,534

Claims priority, application Japan, Nov. 2, 1977, 52-147803[U]

Int. Cl.[2] F16C *19/10*

U.S. Cl. 308—233 **12 Claims**



1. A clutch release bearing assembly containing grease in the interior thereof, said assembly comprising:

an outer race;

a side plate coaxial with said outer race on one side thereof;

a bearing cover enclosing said outer race and rotatable therewith;

a pair of shielding plates on said outer race to sealingly close the interior of the bearing assembly, one of said shielding plates and said side plate defining an annular space therebetween exterior of said one shielding plate; and

means defining a plurality of substantially radially extending exhaust passages fluidly communicating said annular space with the exterior of said bearing assembly, said passages extending radially outwardly from said annular space whereby muddy water can be discharged from the interior of the bearing assembly through said exhaust passages by centrigual force upon rotation of said outer race.

4,204,721

MANUFACTURE OF GAS FILLED ENVELOPES

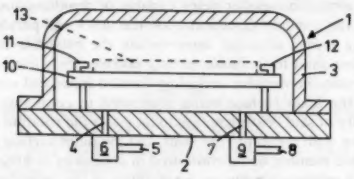
Francois Hubert, Walcourt; Michel Laurent, Nivelles, and Lucien Leger, Montigny-le-Tilleul, all of Belgium, assignors to B.F.G. Glassgroup, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,128

Claims priority, application United Kingdom, Oct. 25, 1977, 44348/77

Int. Cl.[2] H01J *9/26*

U.S. Cl. 316—19 **11 Claims**



1. In a method of manufacturing an envelope which includes a vitreous wall assembled to at least one other wall-forming component, said method comprising the steps of applying said vitreous wall to said other wall-forming component with interposition of a bonding medium to form at least one continuous peripheral joint between them, thereby forming an assembly; introducing said assembly into a hermetically sealable chamber; withdrawing air from the chamber and establishing non-atmospheric gaseous conditions in said chamber to obtain such conditions within the assembly and then hermetically sealing the assembly within said chamber under said non-atmospheric gaseous conditions to form said joint, the improvement comprising depositing at least upon said vitreous wall before the step of applying the same to the other wall-forming component a metallic coating along the zone where said bonding medium is to bond such component, the improvement further comprising the use of solder as the bonding medium to form the continuous peripheral joint and fusing the solder to form the joint by heat generated within the chamber and in the vicinity of said peripheral joint.

4,204,722

MEANS FOR LOCKING A CIRCUIT BOARD TO A CONNECTOR

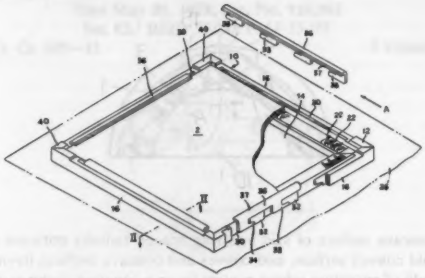
Hiroshi Yasui, Musashi Murayama, and Yoshiaki Ichimura, Akishima, both of Japan, assignors to Japan Aviation Electronics Industry, Ltd., Tokyo, Japan

Filed Oct. 31, 1978, Ser. No. 956,026

Claims priority, application Japan, Jun. 20, 1978, 53-73704

Int. Cl.[2] H01R *13/54;* **H05K** *1/00*

U.S. Cl. 339—17 CF **3 Claims**



1. In combination, an electrical connector for connecting terminal foil strips arranged adjacent to the peripheral edges of an integrated circuit board with conductor elements of another circuit board and a lock member for coupling said connector to said integrated circuit board;

said connector consisting of a rigid dielectric frame member in one piece construction having an opening at a central portion thereof for mounting said integral circuit board therein; and having a plurality of contact elements arranged adjacent to each of the peripheral edges of same frame member so as to correspond to said foil strips of said integrated circuit board, one end of each of said contact elements being formed as a resilient head portion and other end protruding through said frame member to connect with said conductor elements of the other circuit board;

a slit being provided near the outside of each row of said contact elements arranged in each of the peripheral edges of said frame member, said slit being divided by bridge portions into a plurality of openings; and

said lock member comprising individual sections each being adapted to be inserted into a slit and having a protruded edge portion adapted to engage a peripheral edge of said integrated circuit board and a plurality of hook portions adapted to engage in said plurality of openings, whereby when said integrated circuit board is placed within said frame member of said connector and when said lock member sections are inserted into said slits and slid along said slits with the underside of said protruded edge portions in contact with the upper surface of said integrated circuit board, each of said hook portions is engaged with the bottom of the corresponding bridge portion so that said connector and said integrated circuit board are clamped between said protruded edge portion and said frame member whereby said frame member and said integrated circuit board are coupled without deflection.

4,204,723

SAFETY PLUG CLIP

Jack W. Bloomingdale, 950 Orchard Ave., Camp Hill, Pa. 17011

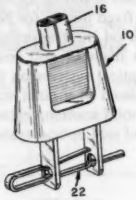
Filed Jan. 26, 1979, Ser. No. 6,574

Int. Cl.[2] H01R *13/44*

U.S. Cl. 339—36 **9 Claims**

1. An improved safety plug clip of the type adapted to be locked on the ends of electrical plug contact blades, the clip

comprising a long leg, a short leg resiliently connected at one end to the long leg so that the legs normally diverge from each other away from the connection, said clip being sufficiently resilient to permit movement of said legs together to a collapsed position for movement in an insertion direction through axially aligned bores formed through the spaced contact blades of the plug to the locked position, a stop surface on the short



leg located between the ends of the long leg for engagement with an interior surface with one of the blades to prevent movement of the clip in one direction from the locked position, and the clip including a second lock surface facing in a direction opposite to that of said first lock surface and engagable with a different blade side to prevent movement of the clip from the locked position in an opposite direction, said long leg extending through the bores in both plug blades.

4,204,724

FILM CASSETTE WITH ANTI-SHOCK LATCHING MEANS

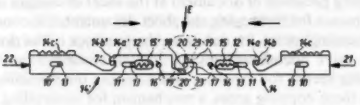
Walter Bauer, Munich; Kröbel, Taufkirchen, and Färber, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A. G., Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,454

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1978, 2818338

Int. Cl.[2] E05C *1/10, 9/04, 9/14;* G03B *17/26*

U.S. Cl. 354—281 **7 Claims**



1. A film cassette comprising a base and a cover, two lock and release means selectively movable for locking the cover to the base in a closed position and for releasing the cover from the base in an open position, and linkage means for linking said two means together such that when forces arise on said two means when a jolt is experienced, the forces on said two means act against one another, whereby the chance of said forces leading to movement of said two means is reduced.

4,204,725

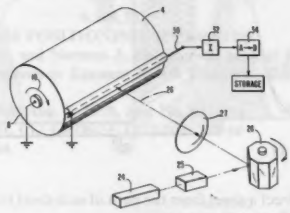
APPARATUS FOR DETECTING INFORMATION STORED ON PHOTOCOPYING MEDIA, TRANSMITTING AND STORING THE SAME

Thomas H. DiStefano, Bronxville, and Lawrence Kuhn, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,394

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **7 Claims**



1. An improved printer/copier device including an optical system for projecting an image onto a charged photoconductor surface, means for toning said image, means for transferring said image onto a recording medium, laser beam scanning means for printing information onto said photoconductor surface; the improvement being that said laser beam scanning means also having the capability of point by point discharging the image on said photoconductor surface and a single sensing electrode to detect changes in charge on said photoconductor surface when said surface is being scanned by said laser beam and means for correcting time decay in a waveform provided by said detected change in charge.

4,204,726

Patent Not Issued For This Number

4,204,727

MULTIMODE REPRODUCING APPARATUS

Donald W. Tates, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

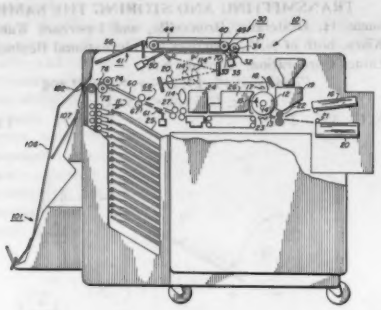
Filed May 3, 1979, Ser. No. 35,372

Int. Cl.[2] B65H *39/10;* G03G *15/00*

U.S. Cl. 355—3 R **15 Claims**

1. A reproducing apparatus output station comprising sorter means, sheet transport means defining a sheet transport path to transport sheets from said reproducing apparatus to said sorter, a first decision gate means in the path of said sheet transport to selectively direct a sheet from the sheet transport path to a first sheet collecting tray, the improvement wherein said output

station comprises a second sheet collecting tray and a second decision gate means in the path of said sheet transport to selectively direct a sheet from the path of said sheet transport to said second sheet collecting tray.



4,204,728

METHOD AND APPARATUS FOR COLOR CONVERSION

Yoshitomo Goshima, Yokohama; Kazuo Kawakubo, Hino; Katsushi Furuichi; Hisashi Sakamaki, both of Yokohama; Osamu Sawamura, Atsugi; Yutaka Komiya, Tokyo, and Masahiro Tomosada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1978, Ser. No. 908,891

Claims priority, application Japan, May 24, 1977, 52-60163; Sep. 9, 1977, 52-108578

Int. Cl.[2] **G03G** *15/01*

U.S. Cl. 355—4 **48 Claims**

1. A color conversion display apparatus, comprising in combination:

(a) color designation means for converting a particular color in a plurality of original image colors into another particular color;

(b) memory means which store therein combination information related to the operation of color forming means to convert the particular original image color to the other color; and

(c) means for indicating possible conversions of the remaining colors in the image original due to combinations of the color forming means in the color conversion of the particular original image color designated by said designation means.

4,204,729

TRANSMITTING AND COPYING MACHINE

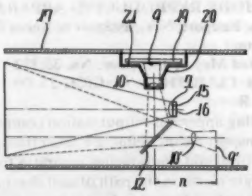
Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Tokyo, Japan

Filed Feb. 28, 1979, Ser. No. 16,520

Claims priority, application Japan, Mar. 20, 1978, 53-32174

Int. Cl.[2] **G03G** *15/28;* **G03B** *27/70*

U.S. Cl. 355—11 **7 Claims**



1. A transmitting and copying machine comprising a light source for illuminating an original held on a table and a first mirror for refracting the light reflected on said original, which are reciprocatably disposed under said table; a second mirror capable of refracting the light from said first mirror and reciprocatable in the same directions as said first mirror at a speed ½ time as that of said first mirror; an optical system on the copying side having an image forming lens for guiding the light reflected on said second mirror to a photosensitive material to form an image thereon; an optical system on the transmitting side having a reading lens for guiding the light reflected on said second mirror to a solid scanning element to form a reduced image thereon; and a fixed mirror for bending the optical axis of said optical system on the transmitting side such that the optical axis passes in front of said image forming lens, the optical axes of said optical systems on the copying and transmitting sides being biased in a main scanning direction, said reading lens and said solid scanning element being disposed on said bent optical axis of said optical system on the transmitting side.

4,204,730

ELECTROPHOTOGRAPHIC APPARATUS

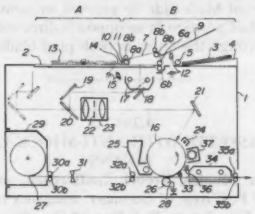
Kiyoshi Miyashita, and Muneo Kasuga, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,799

Claims priority, application Japan, Nov. 24, 1977, 52/139814

Int. Cl.[2] **G03G** *15/00;* **G03B** *27/48, 27/70*

U.S. Cl. 355—14 R **7 Claims**



1. An electrophotographic apparatus for forming image-like modulating information on a photosensitive member and obtaining a plurality of duplicated copies based on the image-like modulating information formed on the photosensitive member by one exposure and scanning of a document to be copied, said apparatus comprising: a casing having a sheet document copying area and a thick document copying area provided on an upper surface thereof, a first document detecting means for detecting presence of document at the sheet document copying area, means for conveying the sheet document, a second document sensing means for detecting the presence of the document at the thick document copying area, a movable exposing and scanning means for exposing and scanning the document present in these copying areas, a mechanism for controlling formation of image-like modulating information on the photosensitive member by means of a signal generated from at least one of the first and the second document detecting means and a signal for informing completion of copying, exposing and scanning means being fixed by a signal generated when the first document detecting means detects the presence of the document and a signal generated when the copying is completed in order to move the sheet document conveying means thereby to expose and scan the document, the exposing and scanning means being moved by a signal generated when the second document detecting means detects the presence of the document and a signal generated when the copying is completed to expose and scan the document, neither document being exposed and scanned or either one of the documents being exposed and scanned by a signal generated when both the first and the second document detecting means detect the presence

of the documents and a signal generated when copying is completed.

4,204,731

APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING WITH MEANS FOR EFFECTING IMAGE PENETRATION THROUGH THE COPY CARRIERS

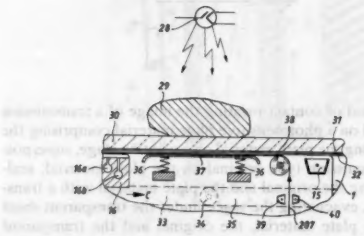
Robert Kohler, Wessling; Jörn Müller, Munich; Dieter Gigl-berger, Unterhaching, and Freidrich Bestenreiner, Grünwald, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,872

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704591

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—16 **8 Claims**



1. In an electrophotographic copying apparatus, a combination comprising a charge carrier plate of transparent material having an electrostatically chargeable surface; means for applying to said surface one side of a flexible sheet-material copy carrier; means for forming a latent electrostatic image of an original on said surface upon application of the copy carrier to the surface, so that the latent electrostatic image penetrates the copy carrier; means for developing the latent image on an opposite side of the copy carrier to produce an actual visible image on said opposite side; a carriage movable along said surface and carrying said means for developing; and a corona charging device also carried by said carriage for applying a uniform electrostatic charge to said surface.

4,204,732

FOCUS ADJUSTING MECHANISM FOR VARIABLE MAGNIFICATION DEVICE

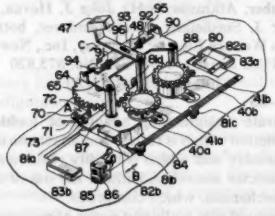
Masahiro Maeda, and Hirohumi Kayahara, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 29, 1979, Ser. No. 43,273

Claims priority, application Japan, Jun. 16, 1978, 53-83002[U]

Int. Cl.[2] G03B *27/52, 13/28, 13/02*

U.S. Cl. 355—55 **10 Claims**



1. A focus adjusting mechanism for use with variable magnification means comprising a support member fixedly supporting a plurality of projecting lenses and movable for selectively bringing one of the projecting lenses to a projecting position, focus adjusting first means shiftable between an operating position and a nonoperating position, second means biasing the focus adjusting first means toward the operating position for rendering a projecting lens adjustable by the focus adjusting first means when the lens is positioned in the projecting position, and third means for shifting the focus adjusting means against the action of the second means to the nonoperating position to permit changing the lenses.

4,204,733

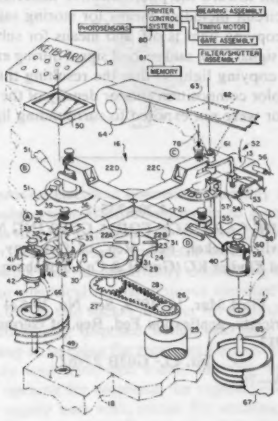
FILM POSITIONING APPARATUS

William Modney, and Norman J. Rosenburgh, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,351

Int. Cl.[2] G03B *27/32, 27/76, 27/64*

U.S. Cl. 355—64 **11 Claims**



1. Apparatus for positioning a generally disk-shaped film unit in a plurality of spaced work positions relative to a plurality of work stations respectively, the film unit having a hub and a plurality of image frames disposed circularly around the hub, said apparatus comprising:

movable means for releasably supporting the film unit;

means for moving said supporting means to locate the supported film unit at each of the positions;

means for releasing the film unit from said supporting means in at least one of said positions; and

means engageable with the hub for moving the released film unit in said one position relative to said supporting means to position selected frames of the released film unit relative a respective one of said work stations.

4,204,734

EXPOSURE CONTROL SYSTEM FOR PHOTOGRAPHIC COPYING MACHINES

Franz Hofstetter, Herbertshausen, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 26, 1978, Ser. No. 872,620

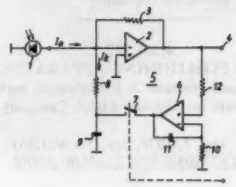
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703415

Int. Cl.[2] G03B *27/78*

U.S. Cl. 355—68 **11 Claims**

1. In a photographic copying machine wherein successive originals are exposed to copying light during imaging onto photosensitive material, exposure control means including at least one detector having an output for transmission of a first

electric signal attributable to the influence of surrounding light while the copying light is turned off and a second signal attributable to the influence of surrounding light and the color composition and/or density of an original while the copying light is on, said detector including a photosensitive portion exposed to surrounding light, facing the original and located outside of the path for propagation of original-modulated



copying light toward the photosensitive material; and a compensating circuit including means for storing said first signal while the copying light is off, and means for subtracting said stored first signal from said second signal during exposure of an original to copying light so that the resulting third signal denotes the color composition and/or density of the original as if said detector were not exposed to surrounding light.

4,204,735

EXPOSURE CARRIAGE FOR A COPYING MACHINE

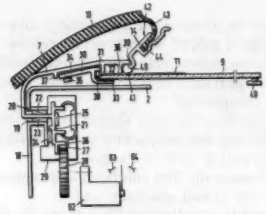
Egon Opravil, Brackel, Fed. Rep. of Germany, assignor to Lumoprint Zindler KG (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,624

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817013

Int. Cl.[2] G03B *27/62*

U.S. Cl. 355—75 **10 Claims**



1. An exposure carriage for a copying machine with a housing having in its top side an exposure window, the exposure carriage including a carriage rail overlying an upper longitudinal side edge of said copying machine, a glass plate movable along the top side of the copying machine and being connected to said carriage rail, a pressure mat at the upper surface of said glass plate and motive means disposed within said copying machine and operatively connected to said carriage rail for reciprocating said carriage rail, the improvement comprising first clamping connecting means (**30**, **31**, **33**, **34**, **35**) for releasably connecting said carriage rail (**7**) to said glass plate (**9**), second connecting means being defined by the connection of said carriage rail (**7**) to said glass plate and serving to releasably receive a hinge profile, and third releasable connecting means intermediate said hinge profile and said pressure mat whereby said connecting means, parts of said exposure carriage, said carriage rail, said glass plate and said pressure mat are detachably assembled by clamping connections.

4,204,736

METHOD AND DEVICE FOR CONTACT-PRINTING

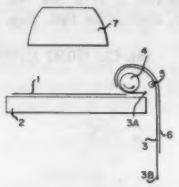
Shinji Hamada, Minami-ashigara; Fumio Hoshino, and Junichi Tabata, both of Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1979, Ser. No. 31,516

Claims priority, application Japan, Apr. 26, 1978, 53-49460; Jul. 11, 1978, 53-84259; Jul. 11, 1978, 53-95317[U]; Jul. 18, 1978, 53-87597; Sep. 6, 1978, 53-123200[U]

Int. Cl.[2] G03B *27/04*

U.S. Cl. 355—118 **17 Claims**



1. A method of contact-printing the image of a transmission type original on a photosensitive plate material comprising the steps of placing the plate material on a printing stage, superposing the transmission type original on the plate material, sealingly covering the original and the plate material with a transparent sheet, evacuating the space under the transparent sheet to bring the plate material, the original and the transparent sheet into close contact with each other and exposing the plate material, the original and the transparent sheet to light, wherein the improvement comprises fixing said original to said transparent sheet in advance at the position at which the original will be registered with the plate material on the printing stage when the transparent sheet is in its closed position in which the transparent sheet lies over the plate material.

2. A device for contact-printing the image of a transmission type original on a photosensitive plate material, comprising a printing stage having means for positioning said plate material at a predetermined position, a transparent sheet movable between an open position in which it is held away from the printing stage to permit change of the plate material on the printing stage and a closed position in which it sealingly covers the plate material on the printing stage, means for detachably fixing at least a part of said transmission type original to said transparent sheet at a predetermined position at which the original will be registered with the plate material on the printing stage when the transparent sheet is in the closed position, and an evacuating means for evacuating the space under the transparent sheet when the transparent sheet is in the closed position to bring the transparent sheet, the original and the plate material into close contact with each other.

4,204,737

SUBSTRATE STRAIGHTENING ADAPTOR FOR ELECTRICAL CONNECTOR ASSEMBLY

Edward S. Faber, Atkinson, N.H.; John J. Hovan, Groveland, and Walter J. Sinsheimer, North Andover, both of Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 31, 1978, Ser. No. 873,820

Int. Cl.[2] H01R *13/20*

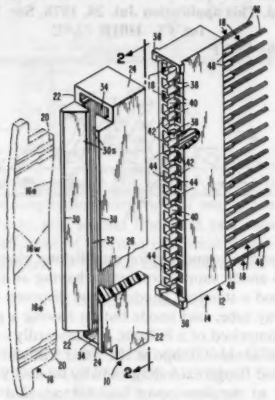
U.S. Cl. 339—65 **2 Claims**

1. A substrate straightening adaptor of molded integral plastic construction which is readily mountable on an electrical connector assembly and which is readily removable from the electrical connector assembly, without the use of an auxiliary connecting mechanism, which comprises:

a pair of opposed side walls and a pair of opposed end walls interconnected to define an elongated essentially rectangular first slot for receiving outer wall portions of a terminal support block in the slot, the opposed side walls being resilient and the spacing between the opposed side walls

intermediate their ends being narrower than the spacing between the side walls at junctions of the side walls with the end walls, so that the side walls produce a friction fit when assembled with the terminal support block on opposite sides of the outer wall portions thereof; and

guide portions projecting inwardly in opposed spaced relationship from respective ones of the opposed side walls to define an elongated essentially rectangular substrate-receiving second slot which is narrower than the first slot,



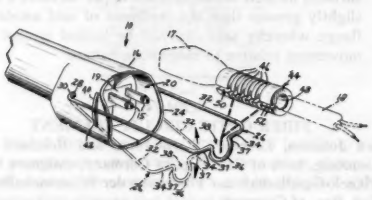
the guide portions including surfaces which are tapered outwardly in opposite directions from the substrate-receiving slot defined by the guide portions, to facilitate insertion of the substrate into the slot, the guide portions also overlying at least portions of the terminal support block in protective relationship when the adaptor is assembled to the terminal support block, and the guide portions acting to straighten a warped leading edge of the substrate as the substrate leading edge is inserted through the narrower second slot into the terminal support block.

4,204,738

ELECTRICAL CONNECTOR RETAINING DEVICE

Henry B. Tillotson, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Mar. 31, 1978, Ser. No. 892,262
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P **7 Claims**



1. A device for securely retaining electrical connectors in a mated configuration, comprising:

a generally U-shaped bail comprising two generally parallel and dimensionally similar retention arm rods, each having a first end for pivotal mounting to a first electrical connector, and an interconnecting clip rod, having two ends each intersecting a second end of a retention arm rod;

mounting means for pivotally mounting said generally U-shaped bail by said first ends of the retention arm rods to the first connector; and

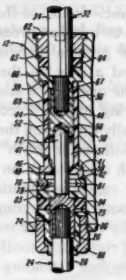
mating means carried by a second connector, comprising a plurality of connection points spaced axially with respect to an axis defined by the connection of the first and second connectors, each of said connection points functioning as a receptacle for accepting said clip rod.

4,204,739

SUBMERSIBLE ELECTRIC MOTOR AND ELECTRICAL CONNECTOR ASSEMBLY

Alden W. Shoenleben, Bradford, Ohio, assignor to Century Electric Motor Co., Gettysburg, Ohio

Filed Nov. 13, 1978, Ser. No. 960,162
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 R **11 Claims**



1. An improved electrical connector assembly adapted for coupling a submersible electric motorwire to a power supply lead wire having an exposed end portion projecting from surrounding insulation, said connector assembly comprising means defining a bore, an electrically conducting socket member, a tubular electrical insulator sleeve disposed within said bore and receiving said socket member for axial sliding movement, a resilient ring disposed within said bore and having means defining an opening for receiving said insulation on said power supply lead wire, said socket member having means defining an opening for receiving the exposed end portion of said power supply lead wire, means for securing said socket member to the exposed end portion of said lead wire, a prong member disposed within said bore and projecting into said sleeve and into said socket member, means for electrically connecting said prong member to said motor wire, means for compressing said resilient ring in an axial direction to produce a fluid-tight seal between said insulation of said power supply lead wire and said means defining said bore, and said sleeve including means responsive to axial movement of said socket member within said sleeve for urging said socket member radially inwardly against said prong member to produce a positive electric connection between said socket member and said prong member.

4,204,740

CONNECTOR COUPLING RING RETAINER APPARATUS AND ELECTRICAL CONNECTOR ASSEMBLY RETAINING MEANS

Ronald F. Krolak, North Riverside, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 453,674, Mar. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 271,352, Jul. 13, 1972, abandoned. This application Nov. 29, 1976, Ser. No. 745,765
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—90 R **20 Claims**

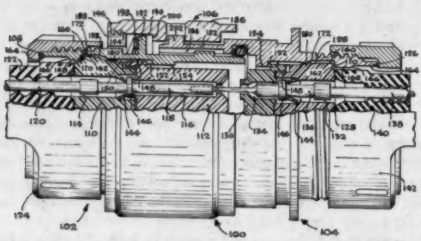
1. An electrical connector assembly for establishing electrical connections between each contact of one plurality of contacts carried by insulating means in a first annular shell and a respective contact of another plurality of contacts carried by insulating means in a second annular shell comprising:

a metal coupling ring encircling said first shell with said ring

having means adjacent one end of said ring for securing said ring to said second shell with each contact of said one plurality of contacts engaged with a respective contact of the other plurality of contacts;

a first plurality of successive annular closed ring teeth integrally formed on the internal surface of said ring adjacent the other end of said ring with each tooth spaced axially of said ring from each other tooth and having an inner radius and an outer radius, each tooth including a camming face extending from the inner radius toward the other end of the ring and to the outer radius at a first predetermined angle of substantially less than 90° to the axis of said ring, each tooth having a stop face extending radially outwardly of the inner radius of the camming face on the respective tooth at another predetermined angle to said axis substantially greater than said first predetermined angle and located axially on the side of the respective tooth adjacent the one end of said ring;

a metal retaining ring having a second plurality of closed ring teeth integrally formed on the outer periphery of said retaining ring with each tooth on said retaining ring spaced from each other tooth on said retaining ring and having an outer radius substantially equal to the outer radius of each tooth on said coupling ring and an inner radius substantially equal to the inner radius of each tooth on said coupling ring, each tooth on said retaining ring having a camming face extending axially toward one end of said retaining ring and from the outer radius to the inner radius at an acute angle to the axis of said retaining ring,



each tooth on said retaining ring having a stop face projecting radially inwardly from the outer radius of the camming face of the respective tooth on said retaining ring to the inner radius at said other greater predetermined angle to the axis of said retaining ring;

the difference between said inner radius and said outer radius dependent on the wall thickness of said retaining ring and said coupling ring for elastically expanding said coupling ring and elastically contracting said retaining ring a distance corresponding to the difference beween said inner radius and said outer radius in response to the engagement of a camming face on one tooth of said retaining ring with a camming face on one tooth of said coupling ring and the application of one axially directed force therebetween to successively move one tooth on each ring in one axial direction relative said coupling ring past a plurality of teeth on the other ring without substantial deformation of the teeth and rings whereby the stop face on each of a plurality of teeth on said retaining ring is each thereafter engaged with a respective stop face on a respective tooth on said coupling ring for preventing movement in another axial direction of the retaining ring relative said coupling ring in response to the application of a force substantially greater than said one force to thereby provide a permanent assembly of said rings; and

stop means for holding said shells and rings against axial movement relative each other with said stop means including biasing means for biasing each stop face on said retaining ring in said other axial direction against an engaged stop face on said coupling ring.

4,204,741

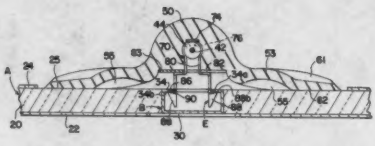
CONNECTOR ASSEMBLY FOR ANODE RING OF CATHODE RAY TUBE

Harold E. Hall, Middlefield, Ohio, assignor to The Stalwart Rubber Company, Bedford, Ohio

Continuation-in-part of Ser. No. 788,835, Apr. 19, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,361

Int. Cl.[2] H01R *13/02*

U.S. Cl. 339—200 P **14 Claims**



1. In an anode connector for establishing electrical contact between an anode supply conductor having an outer layer of insulation and a standard anode button disposed in the side of a cathode ray tube, said anode button having a generally cup like form comprised of a bottom, an outwardly extending side wall, and an annular flange at the outer circular edge of said side wall, said flange extending radially inwardly and defining an opening to the interior of said button, said flange being generally parallel to said bottom and generally coplanar with the outer surface of said cathode ray tube, and having an outer surface and a parallel underside surface within the interior of said button, the improvement which comprises:

a one piece sheet metal clip having a base and a pair of downwardly extending legs,

said base being in the form of a generally cylindrical return bent portion of an inner diameter to encircle and tightly grip the insulation of said anode conductor about an arc greater than 180°, said return bent portion having an axis parallel to said conductor,

an axially extending lug on one axial edge of said cylindrical return bent portion,

a pointed tang extending perpendicular to and radially inwardly toward the axis of said return bent portion, and

a pair of tabs on the lower end of each downwardly extending leg, said tabs having upper surfaces for engaging said underside surface of said flange and each downwardly extending leg having a pair of downwardly facing flat surfaces located above said tab upper surfaces a distance slightly greater than the thickness of said anode button flange whereby said clip will be locked against tipping movement relative to said anode button.

4,204,742

FIBER-OPTIC CIRCUIT ELEMENT

Mark Johnson, Leonberg-Warmbronn, and Reinhard Ulrich, Leonberg, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e. V., Fed. Rep. of Germany

Filed Aug. 18, 1978, Ser. No. 934,984

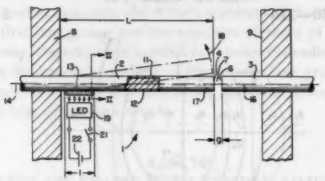
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737499

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.20 **34 Claims**

1. Fiber-optic circuit element comprising at least one first optical fiber arranged at a predetermined fixed location and a second optical fiber clamped at a position with a free end extending at a distance from said clamped position, said free end being movable in a direction at right angles to the longitudinal axis of the first optical fiber, and said free end being controllably positioned to achieve optical coupling between

said first and second optical fibers enabling the passage of light therebetween, and being controllably removable from said coupling position, characterized in that said second movable optical fiber is provided with a heatable expansion layer, between said free end and said clamping position, said expansion layer being constructed to be arranged unilaterally with re-



spect to said longitudinal axis of said second optical fiber, extend in the longitudinal direction of said second fiber, and firmly adhere to said second fiber and said expansion layer having a coefficient of thermal expansion which is different from the coefficient of thermal expansion of said second optical fiber.

4,204,743

CONNECTOR FOR COUPLING OPTICAL FIBRES TO AN EMITTER OR RECEIVER OF LUMINOUS ENERGY

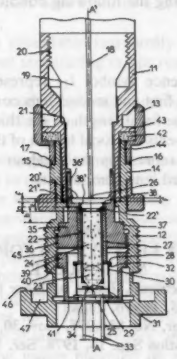
Jean-Francois Etaix, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 806,365, Jun. 14, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,667

Claims priority, application France, Jun. 21, 1976, 76 18791

Int. Cl.² G02B 5/16

U.S. Cl. 350—96.20 **6 Claims**



1. A device for connecting an optical fiber bundle to a light emitter or receiver comprising: a first connection element and a second connection element which can be coupled with the first connection element and locked thereto;

said first connection element comprising:

a first cylindrical envelope, having coupling and locking means; and

a mechanical part for locking, holding and supporting the optical fiber bundle, said part being integral with the first envelope;

said second connection element comprising:

a second cylindrical envelope, having coupling and locking means arranged to cooperate with the coupling and locking means of the first cylindrical envelope;

an optical assembly which includes an emitter or a receiver and an optical image forming device, said device and said emitter or receiver having axes which are mutually aligned; and

means for guiding and rigidly holding said assembly in said second envelope, said means being arranged to rigidly and accurately position, in the axial as well as in the transverse direction, the optical assembly with respect to the fiber bundle,

whereby when the first and second connection elements are coupled, the end of the fiber bundle is optically coupled to the emitter or receiver.

4,204,744

SWITCH FOR LIGHT CONDUCTING FIBERS

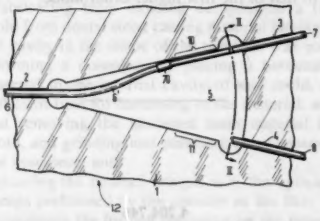
Julius Wittmann, Deisenhofen, Fed. Rep. of Germany, assignor to SiemensAktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,162

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704984

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.20 **9 Claims**



1. A switch for optically connecting a first light conducting fiber selectively with at least one second light conducting fiber, said switch comprising a first light conducting fiber having a magnetic sleeve adjacent a free end thereof, at least one second light conducting fiber, a substrate having a first flat surface, a layer disposed on said first flat surface, said layer having a recess with a groove for each of said first and second fibers extending therefrom, each of said second fibers being disposed in their respective groove with the free end extending into said recess and said first fiber being disposed in its groove with its free end having the magnetic sleeve being mobile in said recess and being guided by said first flat surface between a first position forming an optical connection with at least one of said second fibers and a second position out of optical connection from said one second fiber so that an application of an external magnetic field causes said free end of said first fiber to move between said first and second positions.

4,204,745

OPTICAL FIBER

Junichi Sakai, and Tatsuya Kimura, both of Tokorozawa, Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo, Japan

Filed Jun. 12, 1978, Ser. No. 914,548

Claims priority, application Japan, Jun. 10, 1977, 52/68513

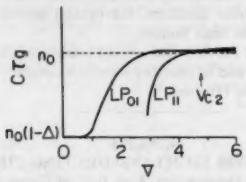
Int. Cl.² G02B 5/14

U.S. Cl. 350—96.31 **6 Claims**

1. A graded index optical fiber comprising a core and a cladding provided coaxially with said core whose refractive index distribution (n) at the radial length (r) from the core axis is given by

$$n = \begin{cases} n_O(1 - \Delta(r/a)^\alpha), & O \leqq r \leqq a \\ n_O(1 - \Delta) = n_c, & r \geqq a \end{cases}$$

where n_0 is the refractive index at the core center, (a) is the core radius, α is a power exponent, $\Delta=(n_0-n_e)/n_e$, and n_e is



the refractive index of the cladding, said fiber is, characterized in that the value α and the normalized frequency

$$v\left(=\frac{2\pi a n_0}{\lambda}\sqrt{2\Delta}\right), \lambda \text{ is the wavelength)}$$

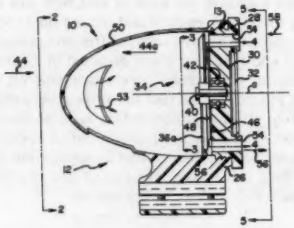
are designed so that the group delay of the fundamental mode is equal to that of the first higher order mode.

4,204,746

REFLECTIVE SIGNALLING DEVICE

Clyde E. Fisher, P.O. Box 207, Owosso, Mich. 48867

Filed Oct. 7, 1977, Ser. No. 840,135
Int. Cl.² G02B 5/12
U.S. Cl. 350—99 16 Claims



1. Nocturnal reflector apparatus for signalling the presence of a forwardly moving bicycle or the like, illuminated by the light beam of an approaching motorist or the like, comprising:

a hollow housing having a rear portion and a forward, hollow, light beam transmitting shield portion; and

air driven, light interrupting means, mounted within said hollow housing in axial alignment with said forward light beam transmitting portion for rotation about an axis relative to said housing, for interrupting at least a portion of said light beam;

at least one of said rear portion and said interrupting means including light reflecting means for forwardly reflecting a portion of said light beam;

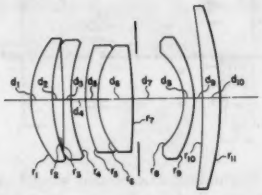
said housing including openings therein for rearwardly passing ambient air from said forward portion toward said rear portion to said interrupting means to rotate said interrupting means as said apparatus moves forwardly.

4,204,747

METHOD OF FOCUSSING IN A PHOTOGRAPHIC LENS SYSTEM

Toshihiro Imai, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,366
Claims priority, application Japan, Nov. 29, 1977, 52-142168
Int. Cl.² G02B 9/60
U.S. Cl. 350—216 3 Claims



1. A method of focussing in a photographic lens system by arranging a front convergent lens group and a rear divergent lens group with the said front convergent lens group comprising a first lens component having a positive refracting power, a second lens component having a negative refracting power and a third lens component having a positive refracting power, and by causing the said third lens component to move within the said photographic lens system.

2. A photographic lens system having a front convergent lens group and a rear divergent lens group, the said front convergent lens group comprising a first lens component having a positive refracting power, a second lens component having a negative refracting power and a third lens component having a positive refracting power, the said third lens component being movable in performing the focussing, and the said lens system satisfying the following conditions:

(1) $4<f_{12}/f$
(2) $f_3/f<0.7$
(3) $0.04<d/f$

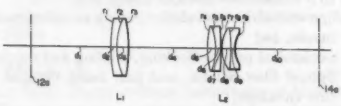
wherein the reference symbol f_{12} represents the composite focal length of the first and second lens components, the symbol f_3 represents the focal length of the third lens component, the symbol f represents the focal length of the total lens system and the symbol d represents the axial air space between the second and the third lens components.

4,204,748

A FOCAL RELAY LENS SYSTEM FOR AN INVERTED MICROSCOPE

Ken Yonekubo, Hachiouji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 856,095, Nov. 30, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,393
Claims priority, application Japan, Dec. 10, 1976, 51-148423; Dec. 10, 1976, 51-148424
Int. Cl.² G02B 9/12
U.S. Cl. 350—228 4 Claims



1. An afocal relay lens system comprising a first lens group consisting of a positive cemented doublet and a second lens group consisting of a positive cemented doublet and a negative cemented doublet, said afocal relay lens system being arranged for positioning between the contact surface of a revolver and

that of a microscope tube, and said afocal relay lens system satisfying the following conditions:

(1) $1.45 < n_2 < 1.55$, $55 < \nu_2 < 71$

(2) $1.5 < n_6 < 1.56$, $55 < \nu_6 < 65$

(3) $0.14f_2 < r_9 < 0.18f_2$

wherein the reference symbols n_2 and n_6 represent the refractive indices of the rear element of the first lens group and the rearmost element of the second lens group, the reference symbols ν_2 and ν_6 designate the Abbe's numbers of the rear element of the first lens group and the rearmost element of the second lens group, the reference symbol r_9 denotes the radius of curvature on the rearmost surface of the second lens group and the reference symbol f_2 represents the total focal length of the second lens group as a whole.

4,204,749

EYEGLASS FRAME WITH TEMPLE ADJUSTING BRACES

John A. Davis, 231 Junipero Ave., Apt. 12, Long Beach, Calif. 90803

Filed Jan. 23, 1979, Ser. No. 5,827

Int. Cl.[2] G02C *5/14*

U.S. Cl. 351—123 **5 Claims**

1. An eyeglass frame having

a frontal lens support with a pair of lens holders joined by a central bridge,

foldable temples extendable rearwardly from both of said lens holders and terminating in tips remote from said lens holders

pads located on said temple tips and having inwardly directed surfaces that enhance friction against the head of a wearer,

temple hinges joining said temples to said lens holders,

bracing fastened to each of said lens holders above the level of said temple hinges and extending at an angle downwardly and rearwardly to pass outboard adjacent to said temples at locations spaced rearwardly from said temple hinges at a separation therefrom of at least one and one half inches when said temples are extended,

foldable brace hinges fastening said braces to said lens holders with means for limiting outward movement of said braces relative to said lens holders, and

adjustable biasing means mounted on each of said braces where they pass adjacent said temples including a threaded bushing mounted in said brace and an outwardly disposed thumbscrew engaged therein to act normal to an adjacent temple to bias said temple inwardly to a selected disposition to an adjustable degree.

4,204,750

METHOD OF CUSTOM FITTING EYEGLASS FRAMES AND ARTICLE FORMED THEREBY

James F. Hilbert, 2646 4th St. North, St. Petersburg, Fla. 33704

Continuation-in-part of Ser. No. 731,028, Oct. 8, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,692

Int. Cl.[2] G02C *5/02;* **B29C** *1/02*

U.S. Cl. 351—130 **18 Claims**

1. The method of custom fitting eyeglass frames on the nose of a wearer, which steps are in part performed by an optician or the like and in part performed in an eyeglass frames laboratory, said method comprising:

(1) as steps performed by the optician or the like;

(a) heating a wax wafer to an elevated temperature sufficient to make it malleable under pressure;

(b) positioning the heated wafer on the bridge area of the wearer's nose and applying sufficient pressure to the wafer to cause it to conform to the contour of the bridge portion of the nose;

(c) applying the eyeglass frames against the wearer's nose in a proper viewing position and applying sufficient pressure to the frames to cause the wafer also to conform to the contour of the nose bridge portion of the frames;

(d) removing the resulting wax pattern from both the frames and the wearer's nose and cooling it to fix its shape;

(e) sending wax pattern to an eyeglass frames laboratory;

(2) as steps performed in the eyeglass frames laboratory to produce a nosepiece having a surface configuration corresponding to the nose bridge and frame bridge engaged surface configuration of the wax mold;

(f) trimming the wax pattern to conform the pattern substantially to the outline of the eyeglass frames;

(g) fabricating from molding composition a two-piece mold from dental stone casting material having an internal cavity in the shape of the trimmed wax pattern;

(h) forming a nosepiece by placing a hardenable resin material in the internal cavity of said mold, allowing sufficient time for hardening of the material, separating and removing the hardened resin material from the mold, and grinding and polishing as necessary to form the nosepiece; and

(i) returning the finished nosepiece to the optician;

(3) as steps performed by the optician or the like;

(j) positioning the formed nosepiece on the patient's nose in proper position;

(k) placing the eyeglass frames in correct viewing position against the nosepiece and, with said nosepiece in such position,

(l) permanently attaching the nosepiece to the eyeglass frames.

4,204,751

METHOD AND APPARATUS FOR SYNCHRONIZING THE READING OF AUDIBLE AND VISUAL INFORMATION CARRIED BY DIFFERENT SUPPORTS

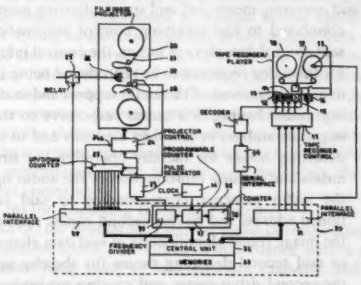
Jacques-Marie N. Game, Ville d'Avray, and Bernard A. Tiesse, Verrieres-le-Buisson, both of France, assignors to Sogitec, Boulogne, France

Filed Jan. 11, 1978, Ser. No. 868,714

Claims priority, application France, Nov. 28, 1977, 77 35788

Int. Cl.[2] G03B *31/04*

U.S. Cl. 352—17 **8 Claims**



1. Apparatus for reproducing an audiovisual program com-

prising an audio sequence and a video sequence respectively carried by different audio and video supports, the audio support carrying a plurality of audio sequences, a plurality of which are acceptable for reproduction with a video sequence and said program not being restricted to the same audio sequence with each video sequence, said apparatus comprising:

(a) first remotely controllable drive means for advancing the audio support in front of a reading head, the audio support comprising an address track with coded words dividing the audio support into consecutive sections each associated with a respective address;

(b) first detecting means responsive to said words for identifying the audio support section running in front of the reading head;

(c) second remotely controllable drive means for advancing image frames of the video support in front of a projection gate, said video support containing address information;

(d) second detecting means responsive to said address information for identifying the image frame of the video support in front of the projection gate;

(e) control data storage means external to said audio and video supports for storing data elements determining a desired audiovisual program to be reproduced, said data elements comprising an address selected from a plurality of addresses on the audio support section which corresponds to the portion of the audio support carrying the audio sequence of said desired program, separate selected identification of the first image frame of the video sequence of said desired program and the running speed of the image frames during reproduction of the video sequence of said desired program, the stored data elements being modifiable to permit selection of different audio support addresses to be included as data elements for a selected identification of an image frame whereby an audio sequence maybe selected from a plurality thereof to be reproduced with a selected video sequence; and

(f) a control unit comprising:

operating means connected to the first and second drive means and receiving signals delivered by said first and second detecting means to operate said first and second drive means so as to advance a selected audio support section corresponding to the selected address and a selected predetermined image frame corresponding to the selected identification in front of the reading head and the projection gate, respectively to simultaneously reproduce the selected audio sequence and the selected video sequence, and

speed adjusting means connected to said second drive means to adjust the running speed of the video support to a predetermined value,

said operating means and said speed adjusting means being connected to and receiving control information from said control data storage means, the control information for the video sequence to be reproduced being independent of the motion of the audio support and said operating means having first means responsive to the audio sequence address in said data elements and to said first detecting means for thereby operating the first drive means and causing reproduction of the audio signals of the audio sequence corresponding to said last-mentioned address and having second means responsive to the image frame identification in said data elements and to said second detecting means for thereby operating the second drive means and causing projection of the image frame or frames corresponding to said last-mentioned identification.

4,204,752

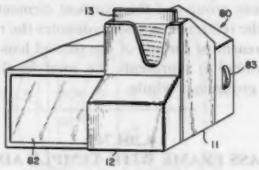
PORTABLE CARD MOTION PICTURE VIEWER

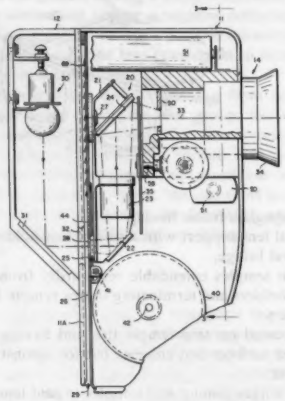
Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 11, 1979, Ser. No. 47,057

Int. Cl.[2] G03B *41/00*

U.S. Cl. 352—82 **8 Claims**





1. Viewer apparatus for use with a film unit having a plurality of images recorded in spaced arcuate rows thereon, said apparatus comprising:

a housing having an opening therein for receiving a film unit at a given film plane;

a gate member located in adjoining relation to said focal plane, said gate member defining an arcuately curved focal location for a single arcuate row of images;

guide surfaces for guiding said film unit, as it is inserted through said opening, to a position wherein the first row of said film unit is located in alignment with said focal location;

means for illuminating each image of the row of images located at said focal location;

means for sequentially directing image forming light rays from each image along a given path for viewing;

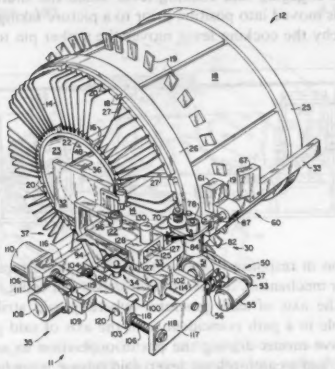
selectively operative means for alternately driving said directing means portion along its arcuate path and for advancing said film unit intermittently one row at a time to sequentially project said images, said advancing means including advancing said film unit back through said opening as said film unit is intermittently advanced row by row.

4,204,753

ROTARY FILM STRIP HOLDING APPARATUS

Bram Kool, Saratoga; Janusz Warszawski, and Jules G. Moritz, both of Los Altos, all of Calif., assignors to Microform Data Systems, Inc., Mountain View, Calif.

Filed Jul. 31, 1978, Ser. No. 929,392
Int. Cl.[2] G03B *23/08, 23/12*
U.S. Cl. 353—26 R 16 Claims



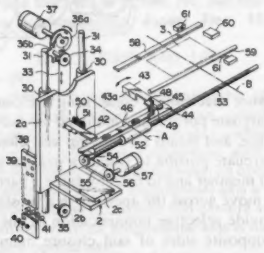
1. Film strip holding apparatus comprising: a cassette having means defining a pair of generally concentric, cylindrical members, the outer periphery of the inner member and the inner periphery of the outer member having a plurality of grooves formed therein, there being a groove on one member radially aligned with a groove on the other member, respectively, aligned pairs of grooves adapted to receive the side edges of respective film strips to permit the film strips to move partially out of and to return to the cassette; means coupled with the cassette for rotating the same about its central axis, the cassette having a side recess for exposing the outer side edge of each film strip when the same is aligned with a predetermined reference point; a rotary drive wheel adjacent to one side of the cassette; means mounting the drive wheel for movement into and out of driving engagement with a side edge of a film strip aligned therewith; a reversible motor coupled with said drive wheel for rotating the same in opposed directions; and means responsive to the rotation of the cassette for selectively positioning a film strip adjacent to the wheel.

4,204,754

FORMAT FILM SELECTING DEVICE

Katsumi Asanuma, Tokyo, and Shigeru Mogi, Yokohama, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 23, 1978, Ser. No. 953,359
Claims priority, application Japan, Oct. 25, 1977, 52/127997
Int. Cl.[2] G03B *23/00, 21/02*
U.S. Cl. 353—116 5 Claims



1. A device for selectively bringing a format film to a projection station in an image projection system comprising in combination,

a cassette containing vertically arranged format films, each format film comprising a mount having guiding means and locating means thereon,

a cassette support means for supporting said cassette,

cassette vertically moving means for moving the cassette support means up and down,

a format film gripping means movable between the projection station and a format film in the cassette which is located at the same level as the projection station, said format film gripping means releasing said format film in the cassette and holding the same when the format film gripping means starts to move from the cassette to the projection station,

format film horizontally moving means for moving the format film in the horizontal direction, and guiding means and locating means on said device for respectively cooperating with the guiding means and locating means on the format film,

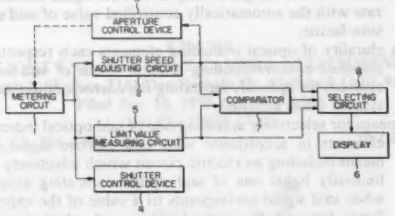
whereby the cassette vertically moving means moves the cassette support means in the vertical direction to select the format film to be brought to the projection station, and the format film horizontally moving means moves the selected format film, guided by said guiding means, to the projection station in which it is accurately positioned by said locating means.

4,204,755

DISPLAY DEVICE IN AN AUTOMATIC EXPOSURE CONTROL CAMERA

Kenji Toyoda, Kawasaki; Yoshitaka Araki, Tokyo, and Sakuji Watanabe, Warabi, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 4, 1978, Ser. No. 966,127
Claims priority, application Japan, Dec. 3, 1977, 52-145513
Int. Cl.[2] G03B *7/08, 17/18*
U.S. Cl. 354—36 6 Claims



1. In an automatic exposure control camera having a circuit for generating a first signal corresponding to a shutter speed determined in accordance with the information on the brightness of an object or determined by manual setting operation, means for setting an aperture diameter in accordance with said first signal and said information on the brightness of the object, an aperture control device for controlling the aperture mechanism of an objective lens mounted on the camera in accordance with the set aperture diameter, and a shutter control device for controlling the shutter speed in accordance with the information on the aperture controlled by said aperture control device and said information on the brightness of the object, the improvement comprising:

means (6) for displaying the shutter speed;

a circuit (5) for generating a second signal corresponding to the shutter speed determined in accordance with a controllable limit value of said aperture diameter and the information on the brightness of the object; and

selecting means (7 and 8) for selecting said first signal when said determined aperture diameter is within said controlla-

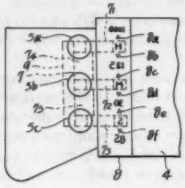
ble limit value and selecting said second signal when said determined aperture diameter exceeds said controllable limit value and for applying said selected signal to said display means.

4,204,756

CAMERA EXPOSURE FACTOR INDICATING DEVICE

Toshio Kobori, Sakai; Masayoshi Sahara, Sennan, and Mitsuru Saito, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 706,215, Jul. 19, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,776
Claims priority, application Japan, Jul. 25, 1975, 50-91349
Int. Cl.[2] G03B *17/20*
U.S. Cl. 354—53 **12 Claims**



1. In a camera having a viewfinder and wherein an exposure factor is automatically controlled in accordance with the brightness of an object to be photographed, an exposure factor indicating device comprising:

first symbols each representative of values of the exposure factor, two of said first symbols respectively representing values critical to high brightness and low brightness and all of said first symbols being arranged in the order of the values of the exposure factor represented thereby;

a plurality of second symbols respectively arranged between said first symbols, said first and second symbols being disposed in said viewfinder to be observed therethrough;

a control circuit for generating an electric signal commensurate with the automatically controlled value of said exposure factor;

a plurality of optical indicating elements each respectively disposed in corresponding relation to one of said second symbols for optically indicating the corresponding second symbol when actuated;

means for selectively actuating one of said optical indicating elements in accordance with said electric signal, said means including an electric circuit which selectively continuously lights one of said optical indicating elements when said signal corresponds to a value of the exposure factor between the critical values and which intermittently lights one of said optical indicating elements disposed respectively in corresponding relation to said second symbols which are in turn adjacent to said first symbols representative of the critical values when said electric signal corresponds to a value of the exposure factor beyond the critical values; and

means for introducing light from the outside of said camera to said first symbols for illumination thereof.

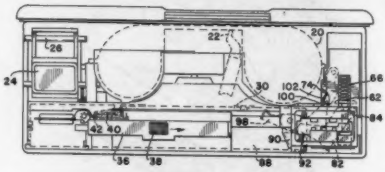
4,204,757

FLASH LAMP OPERATING MECHANISM

George Irwin, and Mark Irwin, both of Highland Park, Ill., assignors to Imperial Camera Corp., Chicago, Ill.

Filed Dec. 14, 1977, Ser. No. 860,609
Int. Cl.[2] G03B *15/03*
U.S. Cl. 354—135 **5 Claims**

1. In a camera construction having a shutter mechanism, a flash mechanism, and a generator responsive to impact forces for energizing the flash mechanism, the generator including an anvil for application of the impact, impact initiating and applying means, a catch for holding the impact means in a cocked position, and spring means normally urging said pin toward said anvil, the improvement wherein said impact means comprises a reciprocally movable striker pin, a rim portion defined by said striker pin, said catch being movable into engagement with said rim portion to hold the striker pin in a cocked position, said shutter mechanism including reciprocally movable drive means, a cocking lever for said striker pin, said drive means engaging said cocking lever when the shutter mechanism is moved into position prior to a picture taking operation whereby the cocking lever moves the striker pin to a cocked



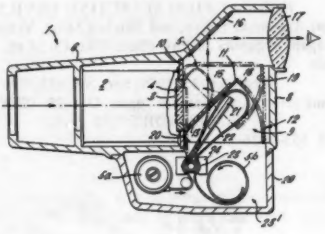
position in response to movement of the drive means by the shutter mechanism, the axis of said striker pin being coincident with the axis of said generator whereby said striker pin is movable in a path coincident with the axis of said generator, the drive means driving the pin in opposition to said spring means, and a catch-release lever, said release lever having one end portion engageable with said catch, a second end portion of the release lever engageable with said drive means, and wherein operation of the shutter mechanism during a picture taking operation causes said drive means to move said release lever against said catch whereby said catch releases said striker pin.

4,204,758

CLOSURE MECHANISM SUCH AS A CAMERA SHUTTER

Keith A. F. Haynes, Watford, England, assignor to John Hadland (Photograph Instrumentation) Ltd., Hertfordshire, England

Filed Nov. 20, 1978, Ser. No. 962,035
Int. Cl.[2] G03B *19/12, 9/08*
U.S. Cl. 354—152 **18 Claims**



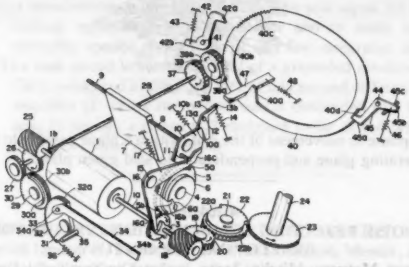
1. A closure mechanism comprising a closure member including an arcuate portion and mounted for movement relative to an aperture, and means for moving said closure member to cause said arcuate portion to roll on a straight support portion of a support member and to thereby cause a part of said closure member to move across the aperture in a substantially straight path to provide selective comunication of the aperture with spaces on opposite sides of said closure member while also providing a permanent barrier preventing communication between said spaces.

4,204,759

CAMERA WITH BUILT-IN MOTOR

Minoru Yamada, Hachioji, and Yasutsugu Nakagawa, Hamura, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1978, Ser. No. 962,913
Claims priority, application Japan, Nov. 25, 1977, 52-142053; Nov. 28, 1977, 52-142519; Dec. 22, 1977, 52-155147
Int. Cl.[2] G03B 1/18, 99/12
U.S. Cl. 354—152 4 Claims



1. A single lens reflex camera including a camera housing, a movable mirror, a mirror charging mechanism, a diaphragm, a diaphragm charging mechanism, a film winding mechanism, a shutter, and a shutter charging mechanism, characterized by comprising at least one small motor disposed horizontally in parallel to a film surface under the movable mirror and at the bottom portion of the housing adjacent to the film surface, an output shaft of the motor projected from both sides of the motor, the mirror charging mechanism being arranged at one side of the movable mirror and connected substantially to the output shaft at one side of the motor, the diaphragm charging mechanism being arranged at the other side of the movable mirror and connected substantially to the output shaft at the other side of the motor, first intermittent motion control means arranged between the output shaft at said one side of the motor and the mirror charging mechanism, second intermittent motion control means arranged between the output shaft at said other side of the motor and the diaphragm charging mechanism, the film winding mechanism being connected to the output shaft at either side of the motor through a respective intermittent motion control means, said first and second intermittent motion control means being constructed and operated such that power is transmitted from the motor to the mechanism by said first and second motion control means in different timed sequences.

4,204,760

FOCUS ADJUSTING DEVICE FOR SELF-CONTAINED INTERCHANGEABLE LENS CAMERA

Haro Kobayashi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1978, Ser. No. 968,953
Claims priority, application Japan, Dec. 15, 1977, 52-169323[U]
Int. Cl.[2] G03B 3/00, 3/02
U.S. Cl. 354—197 21 Claims

1. A self contained multiple interchangeable objective lens camera having a photographic optical axis, comprising:

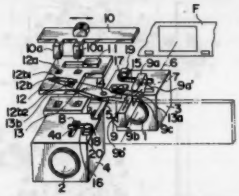
first and second objective lenses movably carried within said camera for interchangeable alignment with said optical axis, each lens being movable between an operative photographic position when its longitudinal axis is substantially aligned with said optical axis of said camera and an inoperative position when its longitudinal axis is displaced from said camera optical axis;

means interconnected between said first and second objective lenses for causing displacement of either one of said objective lenses from said operative position to said inoperative position in response to movement of the other objective lens from said inoperative position to said operative position;

a first driven member associated with said first objective lens and a second driven member associated with said second objective lens for effecting focusing adjustment thereof;

an externally, manually movable distance setting member carried by said camera;

control means mounted in said camera for movement in response to movement of said distance setting member, first and second control portions carried by said control



means, said first and second control portions being selectively engageable with said driven member of one of said first and second objective lenses that is positioned in said operative photographing position for controlling movement of said driven members to effect focusing adjustment of said lenses; and

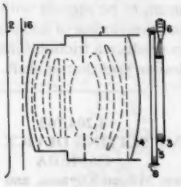
a first and second control surface respectively provided at either one of said first driven member and said first control portion and at either one of second drive member and said second control portion, each control surface lying in a plane parallel to the direction of movement of said driven members when said lenses are displaced between said operative and inoperative positions.

4,204,761

LIGHT ENHANCEMENT CAMERA ATTACHMENT

Joseph B. Walker, 5164 Don Rodolfo Dr., Carlsbad, Calif. 92008

Filed Jan. 15, 1979, Ser. No. 3,556
Int. Cl.[2] G03B 17/00
U.S. Cl. 354—202 10 Claims



1. An attachment to a camera having a photographic lens, comprising;

(a) a transparent planar disc, smaller in periphery than the periphery of the front lens element of said photographic lens,

(b) means to hold said transparent disc in close proximity to said front lens element while photography is accomplished, and

(c) a visible light source exclusively directed at the periphery of said transparent disc,

to cause substantially the whole of said periphery of the transparent disc to glow with light.

4,204,762

CENTRIFUGAL BRAKES FOR FOCAL PLANE SHUTTERS

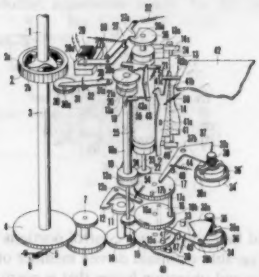
Nobuaki Date; Hiroshi Aizawa, both of Kawasaki; Masanori Uchidoi, Yokohama; Masami Shimizu, Tokyo, and Teiji Hashimoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1978, Ser. No. 942,031

Claims priority, application Japan, Sep. 26, 1977, 52-115699

Int. Cl.[2] G03B *9/32*

U.S. Cl. 354—242 **1 Claim**



1. In a camera having a focal plane shutter provided with shutter shafts on which are wound shutter curtains, said shafts rotating in release and winding up operations, and master gears reciprocally rotatable within a limited range in connection with said shutter shafts for shutter cocking and shutter running down purposes, a brake device for the shutter comprising:

a fixed brake drum, said brake drum having a shaft fixed at the center thereof, and a pinion rotatable about said shaft;

a sector gear meshing with said pinion, and a brake lever having an arm engageable with said master gear, said brake lever being arranged to engage said master gear when the shutter nears the terminal end of movement, thereby motion of said master gear is transmitted to said pinion;

an engagement member fixedly mounted to said pinion; and

a plurality of slider pieces movably contained within said brake drum and having sliding surfaces conformed to the internal surface of said brake drum;

said slider pieces being engaged with said pinion by said engagement member upon rotation at a high speed within said brake drum to be pressed with said sliding surfaces against the internal surface of said brake drum by a centrifugal force to produce a friction force which activates the braking action on said shutter shaft.

4,204,763

EXPOSURE TIME SETTING DEVICE FOR SHUTTER OF CAMERA

Tadashi Nakagawa; Mitsuo Koyama, and Ichiro Nemoto, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

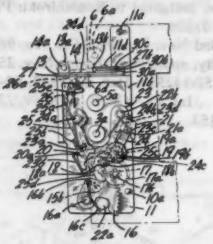
Filed Jul. 12, 1978, Ser. No. 924,088

Claims priority, application Japan, Jul. 15, 1977, 52-95055[U]

Int. Cl.[2] G03B *17/38, 9/64*

U.S. Cl. 354—267 **3 Claims**

2. In a camera having a shutter, an exposure time setting dial disposed on an upper surface of the camera and movable in an operating plane for setting exposure time for the shutter, and an exposure time setting device for effecting the exposure time for the shutter in response to the dial position in the operating plane, the improvement wherein the device comprises: control means movable in a given plane perpendicular to the operating plane for opening and closing the shutter; governor means movable in the given plane for delaying operation of the control means; and an exposure time setting cam movable, in



response to movement of the dial, within a plane parallel to the operating plane and perpendicular to said given plane.

4,204,764

NOISE REJECTING COMPENSATION CIRCUIT FOR DEVELOPING APPARATUS

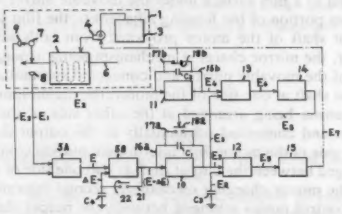
Ryuzo Matsugo, Mitaka, Japan, assignor to Sumiyoshi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1979, Ser. No. 23,180

Claims priority, application Japan, Mar. 28, 1978, 53-35749

Int. Cl.[2] G03D *13/00*

U.S. Cl. 354—298 **4 Claims**



1. A noise rejecting compensation circuit for developing apparatus comprising:

(a) a first photo element **8** to convert a light radiated from a light source **7** after interferring in a developed film into an electrical value E1 and a second photo element **9** to convert a light radiated directly from said light source **7** into an electrical value E2;

(b) a first differential amplifier **5A** to receive said signals E1, E2 from both of said photo elements **8**, **9** and to generate an amplified signal indicating the difference between said signals;

(c) a second amplifier **5B** to receive a signal from said first differential amplifier **5A**;

(d) a first integrator **10** to receive a signal from said second amplifier **5B** and a second integrator **11** to receive a signal E2 from said second photo element **9**;

(e) a by-pass **16***a* installed in a manner to step over said first integrator and having a condenser C1; and a normally opened contact **18***a* installed in a by-pass **17***a* in a manner to step over said condenser C1;

(f) a by-pass **16***b* installed in a manner to step over said second integrator and having a condenser C2; and a normally closed contact **18***b* installed in a by-pass **17***b* in a manner to step over said condenser C2;

(g) a first comparator **12** designed to receive a signal E3 from said first integrator and a basis signal E*a* and to generate a signal E5 for initiating replenishment of developer when said signal E3 reaches the same level of said basic signal E*a*;

(h) a replenishment drive circuit **15** designed to be driven by said signal **E5** for initiating replenishment of developer and to actuate a developer replenishment pump **4** and further to break said normally closed contact **18***b* of said second integrator;

(i) a second comparator **13** designed to receive said signal from said first integrator and said signal from said second integrator and to generate a signal **E6** for ceasing replenishment of developer when both of said signals reach the same level;

(j) a mono-multi circuit **14** to be driven by said signal **E6** for ceasing replenishment of developer and to make said normally opened contact **18***a* of said first integrator; and

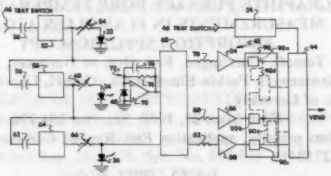
(k) a leak circuit wherein one end of a grounded condenser **C4** is connected to the input side of said second differential amplifier of which the output side is connected to a bypass **21** having a contact **22** designed to be closed when the light source is turned off.

4,204,765

APPARATUS FOR TESTING COLORED SECURITIES

Gerald Iannadrea, Painesville; Robert L. Gorgone, Mentor, and Alan J. Kovach, Cleveland, all of Ohio, assignors to Ardac, Inc., Willoughby, Ohio

Filed Dec. 7, 1977, Ser. No. 858,114
Int. Cl.[2] **G01K** *9/08*
U.S. Cl. 356—71 **8 Claims**



1. In an apparatus for determining the authenticity of a paper, including a tray for receiving and transporting the paper, the improvement, comprising:

a plurality of light source means in juxtaposition to the tray, each emitting light of a different wavelength, for casting light onto the paper;

control means connected to said light source means for energizing each such means for a fixed time period;

light sensor means in juxtaposition to the paper for receiving said light from the paper and producing output signals proportional to the intensity of light of the associated wavelengths received; and

circuit means connected to said sensor means and receiving said output signals therefrom for determining the authenticity of the paper as a function of said output signals, said circuit means comprising:

a gating circuit interconnected between said light sensor means and said control means, said gating circuit having a plurality of outputs and gating each of said output signals to a particular one of said plurality of outputs under control of said control means;

a plurality of holding circuits connected to respective outputs of said gating circuit and receiving and maintaining the peak value of an associated output signal;

a logic circuit connected to said holding circuits, receiving said peak values and determining therefrom the authenticity of the paper; and

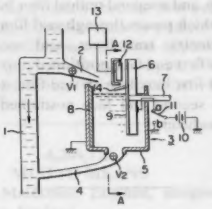
comparator circuits interconnected between pairs of said holding circuits, receiving said peak values therefrom, and comparing said pairs of peak values with each other.

4,204,766

METHOD AND APPARATUS FOR CONTROLLING TONER CONCENTRATION OF A LIQUID DEVELOPER

Yoshiaki Harada, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1977, Ser. No. 808,804
Claims priority, application Japan, Jun. 30, 1976, 51-77176
Int. Cl.[2] **G01A** *3/46*
U.S. Cl. 356—404 **11 Claims**



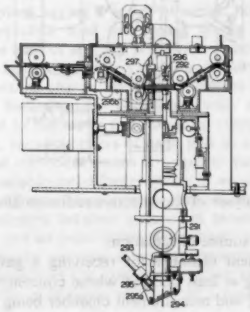
1. A method for controlling toner concentration of a liquid developer, which includes the steps of conducting a part of the liquid developer into a detection cell, establishing an electric field in the detection cell, causing charged toner particles in the liquid developer to deposit upon a detection member under the influence of the electric field, removing the deposited toner particles from the liquid developer, and measuring the concentration of degraded toner particles left in the liquid developer after the deposited toner particles have been removed.

4,204,767

AUTOMATIC CATAPHORESIS APPARATUS

Yutaka Kato, Tama; Hirohiko Tokitoh, Hachioji; Tomohiro Kitahara, Hachioji, and Hiromi Ito, Hachioji, all of Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Sep. 1, 1977, Ser. No. 829,957
Claims priority, application Japan, Sep. 6, 1976, 51-105719
Int. Cl.[2] **G01N** *21/06*
U.S. Cl. 356—444 **1 Claim**



1. An apparatus for examining and analyzing blood serum samples deposited on a strip of film, wherein said film strip bearing blood serum is cataphoretically processed and is carried into one side of the apparatus, comprising means for feeding said film strip along a predetermined path through a photometry location having a film receiving side and a film exiting side, said photometry location including a light source and a photoelectric transducer for photometry of the density distribution of a fractionated pattern of the blood serum, positioning apparatus disposed on the film receiving side of said photometry location and including a positioning photoelectric transducer for producing a detecting signal in response to said

fractionated pattern passing said positioning transducer, means responsive to said detecting signal for stopping the feeding of said film strip at said photometry location where said photometry transducer scans said fractionated pattern to perform a photometry analysis, said positioning apparatus further including a first optical fiber bundle having a first end face positioned to receive light from said light source and a second opposite end face adjacent to said path constructed and arranged so that the width of said first bundle is substantially equal to the width of said film strip, and a second optical fiber bundle for transmitting the light which passes through said film strip to said positioning photoelectric transducer, said second optical fiber bundle having a first end face positioned opposite to the second end face of said first bundle with said film strip moving therebetween and a second end face positioned adjacent to said positioning transducer.

4,204,768

GAS ANALYSERS OF THE SELECTIVE RADIATION ABSORPTION TYPE WITH A CALIBRATION CELL

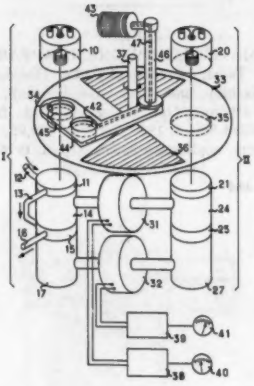
Van L. N'Guyen, Paris, France, assignor to Sereg, Montrouge, France

Filed Jun. 16, 1978, Ser. No. 916,395

Claims priority, application France, Jun. 21, 1977, 77 18904

Int. Cl.[2] G01J *1/02*; G01N *21/00*

U.S. Cl. 356—243 **5 Claims**



1. A gas analyser of the selective radiation absorption type, comprising:

at least one source of radiation;

a measurement chamber for receiving a gaseous mixture containing at least one gas whose concentration is to be measured, said measurement chamber being disposed in a measurement path to receive radiation from the source;

means for periodically interrupting the radiation entering said measurement path;

at least one detector sensitive to, and disposed to receive, radiation which has passed through the measurement chamber;

a calibration cell for cooperating with the said path, said cell enclosing a given concentration of the gas whose concentration is to be measured in a sealed enclosure; and

a flexible-wall chamber, forming part of said sealed enclosure, for controlling the pressure in the interior of said enclosure in accordance with the ambient temperature and pressure.

4,204,769

CUVETTE FOR FLAMELESS ATOM ABSORPTION SPECTROSCOPY

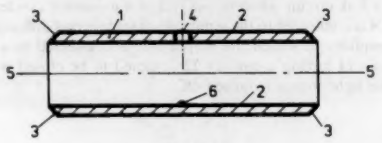
Bernhard Lersmacher, Aachen; Hans Lydtin, Stolberg; Karlheinz Schelhas, Aachen, all of Fed. Rep. of Germany, and Wilhelmus F. Knippenberg, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1978, Ser. No. 870,200

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702189

Int. Cl.[2] G01N *21/16*

U.S. Cl. 356—244 **8 Claims**



1. A cuvette for flameless atom absorption spectroscopy comprising a cuvette basic body member being formed of a carbonized laminated fabric including cotton fabric and at least one of phenol resin or cresol resin, and a carbon layer formed on said basic body member.

4,204,770

GRAPHITE FURNACE BORE TEMPERATURE MEASUREMENTS IN FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

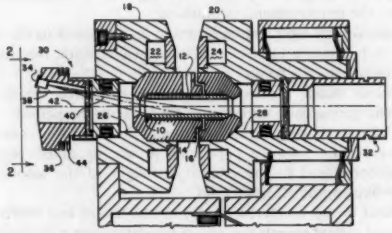
Toma Tomoff, Überlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,796

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718416

Int. Cl.[2] G01J *3/00*

U.S. Cl. 356—312 **5 Claims**



1. In an absorption spectrophotometer sample furnace having a graphite sample atomizing tube mounted between electrodes supported by cooling structures, said graphite tube, said electrodes and said cooling structures having coaxial longitudinal bores to permit passage of a spectrophotometer measuring beam, a temperature sensing means for measuring the temperature of said graphite tube, said temperature sensing means comprising a pyrometric detector positioned with respect to the logitudinal center line of said coaxial longitudinal bores to sense the internal temperature of the graphite tube through the end of said tube and so that the entire length of the surface of said graphite tube is within the field of view of said detector, said detector being mounted to the exterior end surface of a window holder coaxial with center line of said longitudinal bores, said detector being positioned so that the center line of its field of view is non-symmetrical to and inclined at an angle

from the center line of said bores and is directed toward the central portion of the interior surface of said graphite tube.

4,204,771

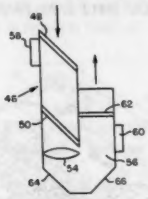
TUNING OF ETALONS

Arthur Shull, 110 Highgate Pl., and George J. Wolga, 324 Snyder Hill Rd., both of Ithaca, N.Y. 14840

Filed May 8, 1978, Ser. No. 903,862

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—346 **1 Claim**



1. An improved instrument for spectral analysis having a tunable acoustooptic filter providing a collimated output light beam and an etalon in optical communication with said light beam so that said beam is incident to said etalon, wherein the improvement comprises:

a Bragg cell arranged to deflect said beam, thereby changing the beam's angle of incidence on said etalon; and

wherein said tunable acoustooptic filter, said Bragg cell, and said etalon are fabricated from the same piece of optically anisotropic medium.

4,204,772

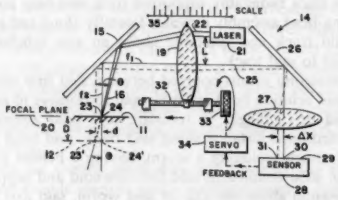
OPTICAL MEASURING SYSTEM

N. Balasubramanian, Cupertino, Calif., assignor to Recognition Systems, Inc., Van Nuys, Calif.

Filed Sep. 25, 1078, Ser. No. 945,628

Int. Cl.[2] G01C *3/00*

U.S. Cl. 356—376 **6 Claims**



1. An optical method of measuring the distance between first and second surfaces with an optical system including the steps of:

(a) passing a collimated light beam through a first lens having a focal plane coinciding with said first surface in a direction parallel to and displaced from the optical axis of said first lens so that said collimated beam is focused to a first point coinciding with the point of intersection of the optical axis of said first lens in said focal plane;

(b) re-imaging light from said first point passing back along the optical axis and through said first lens with a second lens onto a sensor surface, said collimated light beam, first and second lens and sensor surface constituting part of said optical system;

(c) effecting relative movement between said optical system and said second surface to position said second surface to intercept said collimated beam at a second point, said second point being laterally displaced from the point of intersection of the optical axis with said second surface by an amount directly proportional to the distance of said second surface from the focal plane of said first lens;

(d) re-imaging light from said second point passing back through said first lens with said second lens onto said sensor surface, the image of said second point on said sensor surface being laterally displaced from the position occupied by the image of the first point on said sensor surface; and

(e) moving said first lens along its optical axis relative to said second surface until the second point image on said sensor surface reaches the position that the first point image on said sensor surface occupied thereby positioning the focal plane of said first lens in a position coplanar with said second surface, the physical distance over which said first lens is moved indicating the distance between said first and second surfaces.

4,204,773

MIXING MEANS

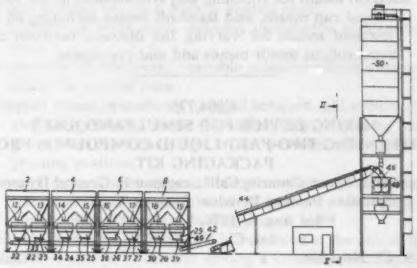
Leonard T. Bates, Maidstone, England, assignor to Winget Limited, Rochester, England

Filed Feb. 21, 1978, Ser. No. 879,886

Claims priority, application United Kingdom, Feb. 18, 1977, 07051/77

Int. Cl.[2] B28C *7/04*

U.S. Cl. 366—18 **1 Claim**



1. A mixing plant having a series of weigh hoppers each mounted on respective load cell means giving continuous indications of the mass of material within the associated weigh hopper, storage hoppers arranged to deliver material to pairs of weigh hoppers to charge the weigh hoppers alternately, variable speed feeder means associated with each weigh hopper arranged to discharge material from respective alternating, charged, weigh hoppers of each pair to a continuous mixer, individual controller means arranged to vary speeds of the respective variable speed feeder means in accordance with signals generated from effecting comparisons during discharge of the weigh hoppers between indications produced by the load cell means and set point values determined in accordance with a continuously variable desired proportioning of the delivery of materials to the continuous mixer and a desired output rate of the continuous mixer from a range of output rates.

4,204,774

SYNCHRONOUS STIRRER

Norman A. de Bruyne, 3700 Brunswick Pike, Princeton, N.J. 08540

Filed Feb. 26, 1979, Ser. No. 15,366

Int. Cl.[2] B01F *15/06, 13/02, 13/08*

U.S. Cl. 366—102 **15 Claims**

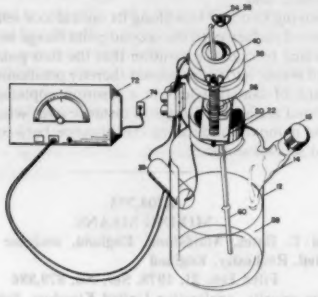
1. A synchronous stirring apparatus for stirring liquid in a container with a stirring element, said apparatus comprising:

cap means for attaching said apparatus to said container;

a flexible sealing means attached to said cap means and to

said stirring element for dependingly supporting said stirring element;

a synchronous motor means attached to said cap means, said synchronous motor means including a stator means for producing a rotating field and a rotor means for rotating in synchronism with said rotating field about a defined axis of rotation;



an eccentric means attached to said rotor means for engaging a section of said stirring element and driving said section in a circular path; and,

stand-off means for attaching said synchronous motor means to said cap means, said stand-off means including an adjustment means for varying the distance between said synchronous motor means and said cap means.

4,204,775

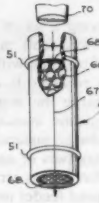
MIXING DEVICE FOR SIMULTANEOUSLY DISPENSING TWO-PART LIQUID COMPOUNDS FROM PACKAGING KIT

Spencer J. Speer, Ontario, Calif., assignor to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Aug. 8, 1978, Ser. No. 932,053

Int. Cl.[2] B01F *5/06*

U.S. Cl. 366—336 **3 Claims**



1. A disposable fluid mixing device comprising:

a first and a second structure, said structures being mirror images of each other;

each of said structures being substantially semi-cylindrical in form and forming a chamber with the other upon mating of said first and second structures, the chamber having an inlet end, an outlet end, a plurality of spherical objects, and a pair of wire mesh retainers adjacent the inlet and outlet ends, respectively, for retaining the objects within the chamber while permitting the flow of fluid therethrough;

said chamber in conjunction with the plurality of spherical objects disposed in said chamber forming a tortuous fluid path for the mixing of fluids therein;

a first semi-circular ridge molded on the outside of each of the structures to form a projection extending about the chamber adjacent the inlet end;

a second semi-circular ridge molded on the outside of each of the structures adjacent the outlet end to cooperate with a selected member to be associated with the mixing device; and

means for securing said structures to each other comprising a retainer ring for mounting adjacent the inlet end over the first ridges.

4,204,776

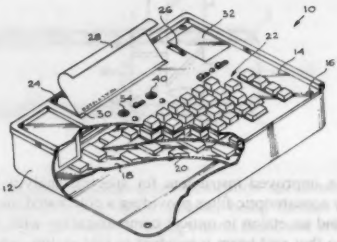
TELETYPEWRITER

James C. C. Lee, 23, (8B) Nuan An St., Taipei, Taiwan

Filed Aug. 16, 1978, Ser. No. 934,170

Int. Cl.[2] B41J *3/20, 19/30*

U.S. Cl. 400—119 **10 Claims**



1. An improved teletypewriter, including:

a base portion;

power means supported in said base portion for providing electrical power to said teletypewriter for the operation thereof;

a first solenoid supported from said base and having a plunger which is moved upon the application of electrical current from said power means to said first solenoid;

a keyboard supported from said base portion and having individual character keys, each of which has associated therewith an electrical circuit which is coupled to said power means and to said first solenoid and is effective upon the depression of such key to apply electrical current to said first solenoid from said power means;

a lateral track swingably supported from said base portion;

a printing-head assembly movable laterally along and guided by said track and rotatable about an axis substantially parallel to said track;

head translating means coupled between said first solenoid and said printing-head assembly and responsive to motion of said first plunger to translate said head assembly a predetermined distance along said track, said head translating means including a worm, having a helical groove and an axis, coupled to said first solenoid and supported for rotation about the axis of said worm, said axis being substantially parallel to said track;

a platen supported from said base portion parallel to said track and adapted for the passage of paper thereover;

said printing-head assembly including a printing head portion movably positioned adjacent said platen for movement thereacross and rotatable about an axis parallel to said platen, a foot portion slidably engaging said track and guiding the motion of said printing-head portion and a groove-tracking pin in engagement with said groove in said worm;

paper-feeding means including a shaft having rollers on one portion thereof, a paper feed knob carried at one end thereof and rotatable therewith and a yoke rotatably carried by said shaft, said yoke having a ratchet pin affixed to one end thereof coaxially with said shaft, but in a plane normal to said shaft, said feed knob having a ratchet portion in engagement with said ratchet pin, whereby motion of said ratchet pin in one direction rotates said knob and said shaft;

a second plunger having operatively associated therewith a

second solenoid and having a yoke receiving portion for engaging said yoke and rotating said yoke upon motion of said second plunger, said yoke being in engagement with said yoke receiving portion;

a swing-lever coupled to said second plunger and said track and responsive to the motion of said second plunger into said second solenoid to swing said track away from said worm and said groove-tracking pin of said printing-head assembly out of said helical groove, whereby said head assembly may be freely slid along said track; and,

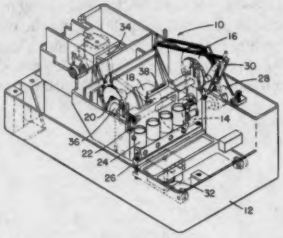
feed-control means coupled to said second solenoid for controlling the activation thereof.

4,204,777

MATRIX PRINTER CONTROL SYSTEM

Tai-Kuang Jen, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 16, 1978, Ser. No. 869,888
Int. Cl.[2] B41J *3/10*
U.S. Cl. 400—124 **16 Claims**



1. A control system for a dot matrix printer having a plurality of aligned printing elements, a

carriage supporting said printing elements in position to print on record material,

means for moving said carriage in reciprocating manner, a

timing member having indicia thereon representative of dot column positions of characters to be printed and indicia for indicating direction of travel of said carriage, a

sensing member for sensing said dot column positions indicia for initiating pulse signals for operation of said printing elements and for sensing said direction of travel indicating indicia,

means for storing print data and control data in random addressable manner and in latching manner, respectively,

character memory means receiving said print data and said control data from said storing means for generating a row of dots in character-by-character sequence,

means for addressing the character memory means for only those positions along a character line corresponding to the positions of the print elements at that time,

means for decoding row and column address for generating a dot row of print data for transmitting decoded data to said character memory means,

means for decoding control data for indicating carriage direction of travel and width of characters to be printed,

means for registering said generated dot row data for each character to be printed according to direction of movement of said carriage in bi-directional printing as sensed by said sensing member, and

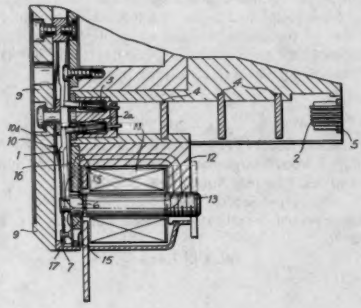
means responsive to the decoded print data from said character memory means for operating said printing elements in accordance with the presence of each dot of a dot row for each respective character as determined by said sensing member.

4,204,778

WIRE TYPE DOT PRINTER HEAD ASSEMBLY

Yoshinori Miyazawa, and Yoshifumi Gomi, both of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki, Nagano, both of, Japan

Filed May 26, 1978, Ser. No. 910,154
Claims priority, application Japan, May 26, 1977, 52-61343
Int. Cl.[2] B41J *3/12*
U.S. Cl. 400—124 **6 Claims**



1. A wire dot type printer comprising:

a printer head having a hollow central core;

a plurality of print wires slideably mounted in said central core;

a plurality of selectively operable solenoid means disposed about the central core;

clapper means operatively coupled between said print wires and said solenoid means for selectively displacing said print wires between a first at rest position and a second printing position;

biasing means for biasing said clapper means towards the at rest position after completion of printing, said clapper means mounted on said biasing means; and

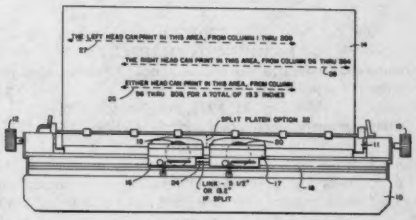
biasing means mounted to said printer head at the axis of the hollow central core, and having a cantilever leaf spring having a central mounting portion and a plurality of radially extending cantilever arms, each arm formed with a leaf spring at the free end thereof with an internal leaf finger extending towards the central axis with said clapper means mounted on said cantilever leaf spring finger.

4,204,779

HIGH CHARACTER CAPACITY IMPACT PRINTER

Sen L. Lee, Hayward; Franklin B. Shah, Fremont, and John W. Jamieson, San Leandro, all of Calif., assignors to Qume Corporation, San Jose, Calif.

Filed Apr. 7, 1978, Ser. No. 894,540
Int. Cl.[2] B41J *1/30, 3/54*
U.S. Cl. 400—144.2 **12 Claims**


THE LEFT HEAD CAN PRINT IN THIS AREA, FROM COLUMN 1 THRU 306
THE RIGHT HEAD CAN PRINT IN THIS AREA, FROM COLUMN 96 THRU 384
EITHER HEAD CAN PRINT IN THIS AREA, FROM COLUMN
96 THRU 306, FOR A TOTAL OF 10.2 INCHES
SPLIT PLATEN OPTION
LINK - 8 1/2"
OR 13.5"
IF SPLIT

1. An impact printer responsive to character commands for printing characters serially on a record medium comprising: a

plurality of print wheels each having a mechanically limited number of characters and each having at least some unique characters relative to the other print wheel or wheels; a plurality of carriages, with said print wheels rotatably mounted thereon respectively, linearly movable along a common predetermined path to place said print wheels in printing positions along said path, and mechanically linked together to maintain a predetermined spacing therebetween throughout said linear movement; logic means responsive to said character commands for coordinating the printing wheels in a common area of said record medium, said logic means generating a carriage move command equal to the spacing between print wheels in response to the character command previous to the present character command occurring on another print wheel to bring the other print wheel to a printing position.

4,204,780

TYPEWRITER WITH IMPROVED CASE SHIFT MEANS

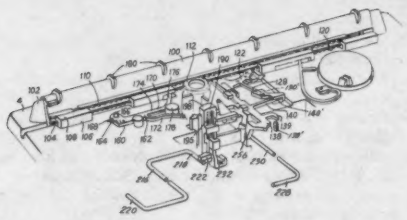
Anthony Elliott, Nottingham, England, assignor to Dobson Park Industries, Limited, Nottingham, England

Filed Sep. 15, 1977, Ser. No. 833,446

Claims priority, application United Kingdom, Sep. 21, 1976, 39140/76

Int. Cl.[2] B41J *11/16*

U.S. Cl. 400—261 **6 Claims**



1. A typewriter having a body, a typebar assembly and a carriage which is movable vertically relative to the typebar assembly to enable the carriage to take up one of three positions to provide three cases of type, in which the carriage rests on a single shift member slidable vertically in guides formed in the typewriter body, and there is provided biasing means acting between the typewriter body and the shift member and biasing the shift member upwardly with a force sufficient to overcome the weight of the carriage acting on the shift member, stop means preventing upward movement of the shift member by the biasing means beyond an intermediate position, a first shift key linked to the shift member so that actuation of the first shift key lifts the shift member and carriage beyond the intermediate position to an uppermost position, and a second shift key linked to the shift member so that actuation of the second shift key moves the shift member and carriage downwards against the bias of the biasing means to a lowermost position, the lowermost, intermediate and uppermost positions of the carriage corresponding to the said three cases of type.

4,204,781

CLAMPING TOOLHOLDER

Maier Johann, Reutte, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

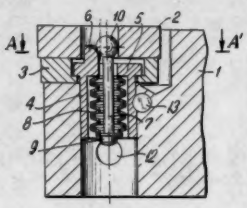
Filed Oct. 11, 1978, Ser. No. 950,376

Claims priority, application Austria, Oct. 12, 1977, 7277/77

Int. Cl.[2] B26D *1/12*

U.S. Cl. 407—105 **5 Claims**

1. A clamping toolholder comprising (i) a shank with a recess for the support of a base plate and a disposable insert of the pin-type and (ii) clamping means included (iii) a bushing fixed in a shank bore below said recess, and (iv) a clamping element having one part extending into the bushing and another part extending into the insert hole, so that the clamping element is supported within the bushing and movable in the direction of the axis thereof; means biasing said clamping element in the direction away from said recess; said bushing including at its upper end a border with a lap and a central bore and a prolongation beginning at said border and extending upwardly to be in the insert hole, the prolongation of the bushing having a symmetry plane, which concurs substantially with the normal direction or the resultant of normals of one or



two adjoining planes of the lateral recess wall and the insert; said clamping element including a pin pervading the central boring of the border of the bushing, and a head part of toroidal shape, located to be in the insert hold; and the prolongation in its surface area next to the head part having a curved shape to permit the head part to adjoine itself to the prolongation at two points, which include an angle of 120° with the axis of the pin, and at one point on the inner wall of the insert hole.

4,204,782

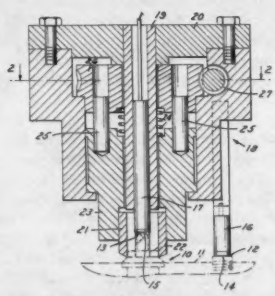
AUTOMATIC SIZING SYSTEM FOR NUMERICALLY CONTROLLED MACHINE

Raymond Spits, Perkstraat 76,B-1960, Sterrebeek, Belgium, and Hans W. Beck, Im Rot 7,D-6920, Sinsheim, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,665

Int. Cl.[2] B23B *39/08*

U.S. Cl. 408—3 **10 Claims**



1. An automatic sizing system for a numerically controlled machine having interchangeable tooling adjustable in its operatively installed condition comprising a combination gauging and adjusting station, means at said station for gauging the effective cutting position of an operatively installed cutting tool on either side of a nominal required cutting position when moved to a gauging position by said numerically controlled machine, and means responsive to said gauging means during continuous gauging of said cutting position for effecting any required adjustment of said cutting tool in either direction to reach said nominal position.

4,204,783

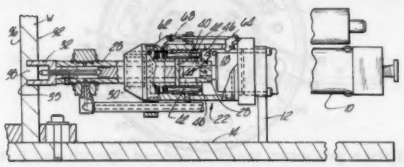
MACHINE FOR CUTTING HOLES WITH ANNULAR CUTTERS

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Filed Mar. 1, 1979, Ser. No. 16,433

Int. Cl.[2] B23B *47/00, 51/04*

U.S. Cl. 408—68 **32 Claims**



1. A machine for cutting holes in a workpiece comprising, a base, a motor, means for mounting said motor in a fixed position on said base, an axially shiftable, rotary driven spindle on said motor, an arbor fixedly connected at its rear end to said spindle to rotate and shift axially with the spindle, said arbor having means at its front end for mounting thereon an annular cutter having a coaxial pointed pilot pin shiftable axially therethrough, means on said base for supporting a workpiece thereon in a fixed position spaced axially forwardly beyond the leading end of the cutter when the spindle is in its retracted position, said spindle being adapted to be advanced axially to cause the leading end of the cutter to engage and cut a circular groove in the adjacent face of a workpiece supported on said base, said arbor having a central axial bore therein, a plunger slideable axially in said bore, means for operably connecting the forward end of the plunger to the rear end of the pilot pin, means for applying a predetermined maximum axial force to said plunger of sufficient magnitude to cause the front pointed end of the pilot pin to firmly engage said face of the workpiece in an axially fixed first position with said maximum force at the axial center of the hole to be formed therein, and means for reducing the force applied by the pilot pin to the workpiece to a value very substantially lower than the magnitude of said maximum force whenever the pointed end of the pilot pin has been displaced axially forwardly beyond said fixed position to a predetermined second fixed position only slightly beyond said face of the workpiece, whereby, as soon as the cutter penetrates through the workpiece and the plunger has displaced the pointed end of the pilot pin and the circular slug within the cutter to said second position, the force exerted by the pilot pin on said slug will have been reduced to said very low value.

4,204,784

TOOLS FOR RECONDITIONING A VALVE SEAT IN A TAP

Jean-Pierre Eckendorff, 29, Avenue Aristide Briand, 27007 Evreux, France

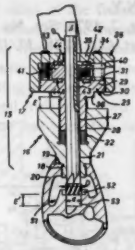
Filed Apr. 20, 1978, Ser. No. 898,454

Claims priority, application France, Apr. 21, 1977, 77 11989; Mar. 6, 1978, 78 06274

Int. Cl.[2] B23C *3/05*

U.S. Cl. 408—83.5 **20 Claims**

1. A tool assembly for use in repairing a seat of a tap, said tool assembly comprising an adaptor for mounting on a tap body to be repaired, said adaptor having a threaded end portion complementary to that of the tap body to be repaired and a support shoulder for axial bearing against an end face of the tap body, said adaptor having a central bore, a guide member in threaded engagement relative to said adaptor, said guide member having a central bore in alignment with said adaptor central bore, a tool shank having a cutting end and being receivable in said bores and guided radially without play along the axial length of said adaptor, means for securing said guide member at a selected axial position along said tool shank, rotatable mounting means mounting said tool shank relative to said guide member, thrust bearing means cooperating with said rotatable mounting means and said guide means for ensuring axial abutment without play of said tool shank in each of two axial directions of said tool shank relative to said guide member, whereby said guide member is operable to feed said tool shank for working on a tap seat while the cutting end of said tool shank is positively positioned relative to said adaptor at all times.



4,204,785

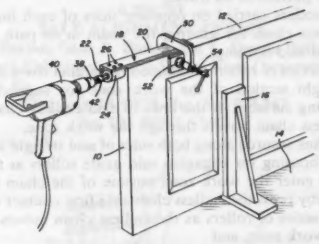
FLUSH DOOR BOLT BORE FORMING JIG

James W. Rowlings, P.O. Box 211, Milton, Mass. 02187

Filed Aug. 22, 1978, Ser. No. 938,302

Int. Cl.[2] B23B *49/00*

U.S. Cl. 408—109 **3 Claims**



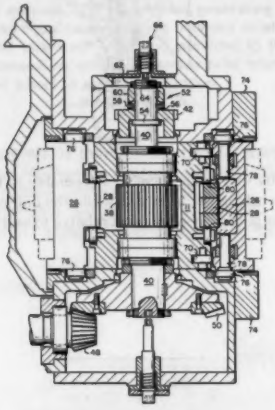
1. A jig for use in drilling a bore along the free swinging edge of a door intermediate the opposite sides thereof, said jig including an elongated right angle member defining substantially right angularly disposed elongated abutment surfaces extending parallelly along a predetermined path disposed in the included angle defined between said surfaces, elongated abutment structure carried by one end of said angle member and defining a journal structure whose center axis coincides with said path, said journal structure being mounted between said surfaces and adapted to journal and slidably receive therethrough the shank end of an elongated wood boring drill member and the other end of said angle iron including clamp means supported therefrom opposing and adjustably shiftable toward and away from one of said surfaces, whereby the door can be clamped between the clamp means and said one of said surfaces.

4,204,786

ENDLESS CHAIN APPARATUS FOR FORMING SPUR AND HELICAL GEARS WITH MEANS FOR CONTROLLING CHAIN

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,779
Int. Cl.[2] B23D *37/18*
U.S. Cl. 409—262 **3 Claims**



1. In apparatus of the type which includes a tool-carrying endless chain assembled from a number of articulated links which each have a gear engaging rack portion depending longitudinally therefrom together with bearing surfaces adjacent to the depending rack portion, the improvement in means for controlling movement of the endless chain as it passes through a work zone in which its tools make contact with a workpiece, characterized by

a housing defining a path of travel for the endless chain, with the path of travel having a straight section in the work zone portion of its travel,

guide rollers carried on opposite sides of each link of said endless chain for guiding the chain in its path of travel about said housing,

a first series of rollers positioned in parallel rows along said straight section of the work zone for supporting said bearing surfaces of the links of said endless chain as the endless chain travels through the work zone,

gib means secured along both sides of said straight section of said housing for engaging said guide rollers as the chain links enter the work zone portion of the chain travel to thereby press the endless chain into firm contact with said first series of rollers as the endless chain moves through the work zone, and

a second series of rollers positioned in parallel rows in the straight section of said housing for contacting and guiding opposite sides of the depending rack portions of said links of the endless chain to prevent unwanted side-to-side deflections of the endless chain as it moves through the work zone.

4,204,787

MILLING CUTTER

David M. McCray, Latrobe, Pa., and Gerald D. Murray, Concord, Ohio, assignors to Kennametal Inc., Latrobe, Pa.

Filed Aug. 21, 1978, Ser. No. 935,087
Int. Cl.[2] B23C *5/26, 5/20*
U.S. Cl. 409—234 **15 Claims**

1. A milling cutter comprising: a rotatable adapter plate having a central protrusion with a taper thereon; a cutter ring having a central opening for receiving said protrusion; recesses on said cutter ring for seating cutting inserts; cooperating surfaces of abutment means on said cutter ring and adapter; clamping means for clamping said ring and said adapter into

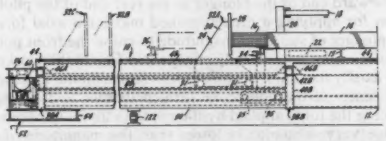
rigid nonrotatable abutment with one another; and in an assembled but unclamped position, one of said abutment surfaces on said ring and said adapter having a concave portion when viewed from the other surface from said one surface.

4,204,788

SQUARING DEVICE FOR STORAGE OF RODS, TUBES, AND LIKE ARTICLES

John P. Massey, 421 Ruby Ave., Clarendon Hills, Ill. 60514

Filed Jul. 31, 1978, Ser. No. 929,579
Int. Cl.[2] B65B *35/40*
U.S. Cl. 414—21 **5 Claims**



1. In a material handling and storage system for rods, tubing, and like stock articles of predetermined lengths, of the type comprising a rack including a plurality of storage pockets or cubicles, a plurality of open-ended containers for holding stock articles and designed to fit into the rack pockets with clearances between containers, the containers having lengths shorter than the lengths of the stock articles stored therein, and means for depositing and retrieving containers in the pockets, the improvement comprising a squaring device for locating stock articles in centered relation in the containers so that the articles will not interfere with movements of other containers in use of the storage system, the squaring device comprising:

an elongated base;

a pair of squaring heads mounted on the base in facing relation to each other and movable along the base toward each other from initial rest positions;

container support means, comprising a pair of dollies, each mounted on wheels engaged in tracks extending longitudinally of the base, for supporting one of the containers in approximately centered relation to a centerline midway between the rest positions of the squaring heads, with the open ends of the container facing the squaring heads, the dollies being adjustable, longitudinally of the base, to accommodate containers and stock articles of varying lengths;

and motive means, connected to the squaring heads, for driving the squaring heads toward each other simultaneously and at equal speeds to engage the ends of the stock articles and square the stock articles in centered relation in the container;

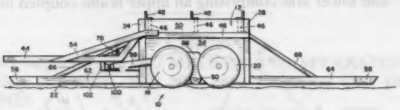
the motive means further including means for driving the squaring heads simultaneously back to their rest positions.

4,204,789

PASS THROUGH HAY BALE RETRIEVER

Frank Parks, Jr., Rte. 1, Box 57, Henryetta, Okla. 74437

Continuation of Ser. No. 736,999, Nov. 29, 1976, abandoned.
This application Mar. 27, 1978, Ser. No. 890,793
Int. Cl.[2] B60P *1/38*
U.S. Cl. 414—24.5 2 Claims



1. A pass through hay bale retriever comprising a relatively short main frame means having a centrally disposed substantially tunnel-shaped unobstructed recess extending longitudinally therethrough, rail means secured to the main frame means and extending longitudinally through and beyond each end of said tunnel-shaped recess through a distance at least equal to the length of one hay bale, wheel means operably secured to the main frame means in the proximity of the tunnel-shaped recess for supporting and transporting of the hay bale retriever across the surface of the ground, means operably connected between the wheel means and the main frame means whereby the rail means and main frame means may be alternately lowered and raised with respect to the surface of the ground through a substantially straight vertical path and including means for maintaining said rail means in a substantially horizontal position during raising and lowering thereof, said real means being disposed adjacent the opposite sides of the hay bale in the lowered position for an initial engagement therebetween, said rail means supporting said hay bale in an elevated position in the raised position for retrieving of the hay bale, and wherein the wheel means includes a first pair of substantially co-planar wheels disposed in relatively close relationship to one another and carried by a common link member which is secured to one side of the main frame means, and a second pair of substantially co-planar wheels disposed in substantially close relationship to one another and carried by a second common link member which is secured to the opposite side of the main frame means, said second pair of wheels being disposed in substantial axial alignment with said first pair of wheels, and wherein the raising and lowering means comprises bell crank means cooperably connected with each pair of wheels and pivotal between a first and second position, hydraulic cylinder means operably connected to one end of said bell crank means for pivoting thereof between said first and second positions, rod means connected between the opposite end of said bell crank means and the main frame means whereby actuation of the hydraulic cylinder for pivoting the bell crank to the first position results in a lowering of the main frame means with respect to the surface of the ground, and actuation of the hydraulic cylinder for pivoting of the bell crank to the second position results in elevating of the main frame means with respect to the surface of the ground.

4,204,790

TRAILER FOR LIFTING AND TRANSPORTING ROUND BALES OF HAY

Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

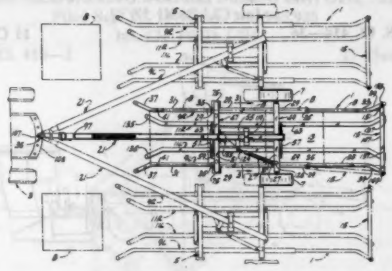
Filed May 26, 1977, Ser. No. 800,698
Int. Cl.[2] A01D *87/12*; B65G *57/32*
U.S. Cl. 414—24.5 14 Claims

1. A trailer adapted to be towed by a towing vehicle for picking up round bales of hay or the like lying on their sides on the ground and transporting the bales, said trailer comprising:

a frame generally of inverted U-shape thereby having a top and sides extending down from the top, the top comprising means which is extensible and retractable for varying the spacing of the sides;

a wheel at each side of the frame at the bottom of the frame, said wheels being on an axis extending transversely of the frame;

rails carried by the sides of the frame extending longitudinally at opposite sides of the frame on the inside of the sides of the frame, the rails extending forward and rearward from the frame and spaced apart transversely of the frame for supporting a series of round bales cradled in the rails in end-to-end relation with the series extending through the frame between the sides of the frame and



under the top of the frame, said rails comprising an upper rail and a lower rail carried by each side of the frame on the inside thereof, the upper rails being closely adjacent the sides of the frame and the lower rails being carried by means extending inward from the sides of the frame so that the lower rails are spaced a distance less than the spacing of the upper rails;

means for hitching the frame to a towing vehicle;

power means for raising and lowering the frame relative to the wheels thereby to raise and lower the rails; and

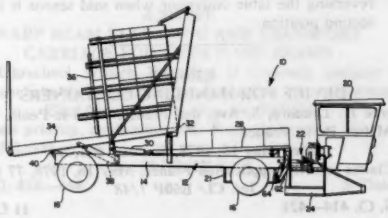
power means for extending and retracting the extensible and retractable top means for varying the spacing of the sides of the frame and the rails carried thereby.

4,204,791

BALE ALIGNMENT DEVICE

Lester C. Barton; Gene R. Butler, and L. Dennis Butler, all of Kingsburg, Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 14, 1978, Ser. No. 933,242
Int. Cl.[2] B65G *57/32*
U.S. Cl. 414—36 6 Claims



1. A bale alignment device for a bale wagon having a table for receiving a plurality of bales thereon in a row prior to transfer to a tier forming means and means for transferring bales from said table to said tier forming means, said bale alignment device, comprising:

means for conveying the bales along said table from a bale receiving end thereof;

means for determining when the first bale received on said

table reaches a predetermined point remote from said bale receiving end; and

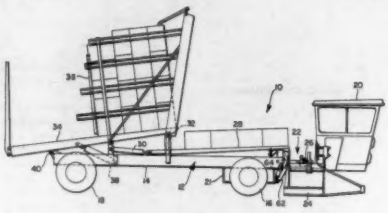
means responsive to the overall length of the row of bales when the first bale reaches said predetermined point for reversing said conveying means to reposition the last bale on said table toward said bale receiving end when a short row is encountered.

4,204,792

BALE ALIGNMENT MECHANISM ACTUATING DEVICE

Edward J. Wynn, Leola, and Cal L. Bryant, Lancaster, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 14, 1978, Ser. No. 933,243
Int. Cl.[2] B65G *57/32*
U.S. Cl. 414—36 **11 Claims**



1. An actuating device for the bale alignment mechanism of a bale wagon table, comprising:

a lever positioned at the bale receiving end of the table and having a portion lying in the path of any bales of the table;

said lever having means associated therewith for permitting said lever to be displaced from a rest position when contacted by a bale and for returning said lever to said rest position when the bale is removed;

an electrical sensor having a first position and a second position;

sensor actuating means for placing said sensor in said first position when said lever is displaced from said rest position and for placing said sensor in said second position when said lever is in said rest position, one of said sensor actuating means and said sensor being mounted in a fixed location adjacent said lever and the other of said sensor actuating means and said sensor being attached to said lever; and

electrical means interconnecting said sensor with the table transfer mechanism for permitting operation of the transfer mechanism when said sensor is in said first position and for preventing operation of the transfer mechanism and reversing the table conveyor when said sensor is in said second position.

4,204,793

DEVICE FOR HANDLING CONTAINERS

Pierre H. Lemaire, 5, Ave. des Frenes, Vaux-le-Penil, 77000 Melun, Paris, France

Filed May 15, 1978, Ser. No. 905,746
Claims priority, application France, May 16, 1978, 77 14844
Int. Cl.[2] B60P *1/48*
U.S. Cl. 414—421 **11 Claims**

1. A device mounted on a frame supported by cross members mounted on a vehicle, for (i) handling a container from the rear of the vehicle with prehension of the container by the front end thereof, (ii) discharging said container from the vehicle, and (iii) inclining the container mounted on the vehicle in order to discharge the contents thereof, said device comprising:

a horizontal transverse rear shaft located at the rear of the vehicle and supported by the frame;

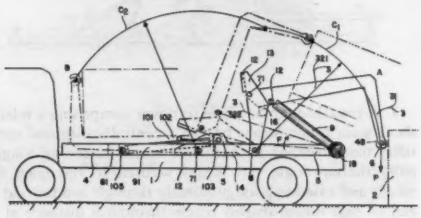
a tipping chassis having a rear end pivotably mounted on said rear shaft;

a horizontal transverse coupling shaft mounted on said tipping chassis forward of and parallel to said rear shaft;

an articulated handling gantry pivotably mounted on said coupling shaft, said gantry comprising pivotably interconnected upper and lower arms forming in one position thereof a rectangular angle bracket,

said upper arm having a free end comprising a prehension member,

said lower arm comprising an upper boom coupled to and



supporting said upper arm, and a lower boom having a first part hinged to and supporting said upper boom, and a second part mounted to said coupling shaft; and

at least one hydraulic handling jack for causing said free end of said upper arm to move bi-directionally between the front and rear ends of the vehicle frame,

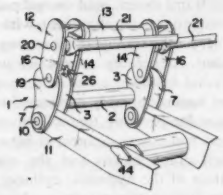
said hydraulic handling jack being pivotably mounted at a front end thereof, to a point located on the upper boom of the gantry lower arm, and at a rear end thereof to said rear shaft.

4,204,794

APPARATUS FOR ATTACHING IMPLEMENT TO EARTH MOVING VEHICLE

Norihiro Aoshiba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 18, 1977, Ser. No. 816,706
Int. Cl.[2] E02F *3/81*
U.S. Cl. 414—723 **6 Claims**



1. An apparatus for attaching an implement to an earth moving vehicle, said implement having a C-shaped hook formed on a rear surface thereof, the apparatus comprising:

a pair of lift arms for lifting the implement;

a pair of tilt rods for effecting tilting motion of the implement;

a pair of lower couplers pivotally connected to said lift arms at one end thereof;

a pair of upper couplers pivotally connected to said tilt rods, said lower and upper couplers being pivotally connected with each other;

an upper connecting beam provided between said pair of upper couplers for connecting said upper couplers;

a lower connecting beam provided between said pair of lower couplers for connecting said lower couplers, said upper and lower connecting beams being adapted to engage with the C-shaped hook formed on the rear surface of the implement; and

lock means comprising a first means on one of said upper or

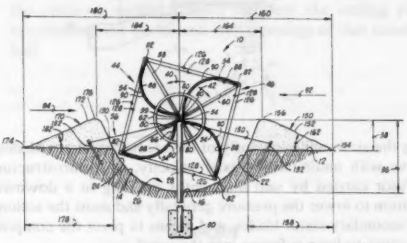
lower couplers for engaging second means on the corresponding other of said upper or lower couplers, said locking means automatically locking said lower couplers relative to said upper couplers thereby preventing pivotal movement with each other when said upper and lower connecting beams are engaged in said C-shaped hooks while allowing pivotal movement of said lower couplers relative to said upper couplers, when in an unlocked state.

4,204,795

WIND COLLECTING METHOD AND APPARATUS

William J. Forrest, 2808 NW. 56th, Oklahoma City, Okla. 73112

Filed Sep. 21, 1977, Ser. No. 835,184
Int. Cl.[2] F03D 3/06
U.S. Cl. 415—2 **12 Claims**



1. A wind collecting apparatus, comprising:

a shaft;

means for journally supporting the shaft for rotation about an axis of rotation; and

at least one blade, each blade having a first side, a second side, a first end, a second end, a first surface extending generally between the first and second ends and generally between the first and second sides, and a second surface extending generally between the first and second ends and generally between the first and second sides, the first end of the blade being connected to the shaft and the blade extending axially along a portion of the length of the shaft generally between the opposite ends of the shaft, the second surfaces of the blade each extend a distance radially from the shaft and a distance axially along the length of the shaft generally between the opposite ends of the shaft, wind moving generally in one direction impacting against the first surface of the blade tending to move the blade in one direction for rotating the shaft in the first direction and wind moving generally in an opposite direction impacting against the second surface of the blade tending to move the blade in an opposite direction for rotating the shaft in the second direction, each blade comprising:

a base constructed of a flexible material having a first side forming the first side of the blade, a second side forming the second side of the blade, a first end forming the first end of the blade, a second end forming the second end of the blade, a first surface forming the first surface of the blade and a second surface forming the second surface of the blade;

a first mesh screen having a plurality of spaced apart wires extending in one direction and a plurality of spaced apart wires extending in a generally transverse direction, the wires extending in one direction being connected to adjacent portions of the wires extending in the transverse direction to form a meshlike screen, the first mesh screen being disposed on the first surface of the base and extending over a substantial portion of the first surface of the base, the first mesh screen enhancing the structural integrity of the blade; and

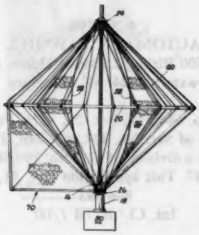
a second mesh screen having a plurality of spaced apart wires extending in a generally transverse direction, the wires extending in the one direction being connected to adjacent portions of the wires extending in the transverse direction to form a mesh like screen, the second mesh being disposed on the second surface of the base and extending over a substantial portion of the second surface of the base, the second mesh screen cooperating with the first mesh screen for enhancing the structural integrity of the blade.

4,204,796

WIND POWERED APPARATUS

Howard Pack, Jr., 817 S. Post Rd., Midwest City, Okla. 73130

Filed Sep. 20, 1978, Ser. No. 943,935
Int. Cl.[2] F03D 3/04
U.S. Cl. 415—2 **17 Claims**



1. A wind powered apparatus comprising:

an external wind shielding shroud including

an upper half of semi-conical configuration and

a lower half of semi-conical configuration abutting said upper half in base-to-base relation;

each of the shroud halves including a plurality of generally triangularly shaped overlapping vanes having air escape spaces provided between the overlapped edges thereof;

a rotor disposed partially within the shroud and including a plurality of circumferentially spaced blades, each oriented in a plane intersecting the planes containing the other rotor vanes in a common line;

means supporting the rotor and shroud for rotation about a common rotational axis coincident with the line of intersection of said planes; and

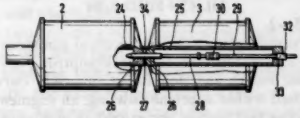
stabilizer means secured to the shroud and projecting from the outer side thereof.

4,204,797

WARP BEAM ELEVATING AND TRANSPORT CARRIAGE FOR TWIN WARP BEAMS

Karl Röhrscheid, Willich, Fed. Rep. of Germany, assignor to System Schultheis GmbH & Co., Fulda, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,332
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722528
Int. Cl.[2] B62B 3/04
U.S. Cl. 414—458 **5 Claims**



1. A warp beam elevating and transport carriage for twin warp beams each having a central tube and ends, the carriage comprising an essentially horizontal rotatable shaft and gripper

arms mounted to the shaft and adapted to be lifted by rotation of the shaft and to engage the ends of the warp beams, which, when engaged, extend coaxially aligned parallel to the shaft at a distance therefrom, the carriage further comprising a connecting plug bridging the gap between the adjacent ends of the central tubes of the twin warp beam and being guided in said adjacent ends and connected to an axially movable element disposed in one of the central tubes and projecting from this central tube at its other end, wherein one of the gripper arms engages the connecting plug of the central tubes in the gap between said adjacent ends thereof, said axially movable element comprises rod means, insertable into one of said central tubes through one of said other ends of said warp beams, for carrying said connecting plug, wherein the rod means comprises two rods separated by a link joint, said rod means further including means for blocking said link joint when the rods are in their straightly aligned position.

4,204,798

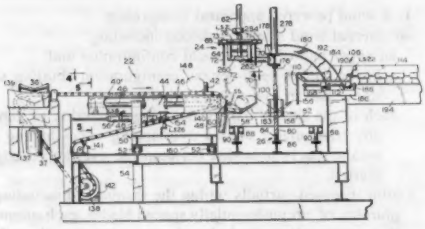
AUTOMATIC SAWMILL

Lyle D. Warren, 500 Birch St., Sweet Home, Oreg. 97386, and Robert W. Brewster, 5924 SE. McNary Rd., Milwaukie, Oreg. 97222

Division of Ser. No. 644,571, Dec. 29, 1975, Pat. No. 4,074,601, which is a division of Ser. No. 434,903, Jan. 21, 1974, Pat. No. 3,960,041, which is a division of Ser. No. 190,589, Oct. 19, 1971, Pat. No. 3,811,487. This application Oct. 31, 1977, Ser. No. 846,893

Int. Cl.[2] B27B *1/00*

U.S. Cl. 414—750 **15 Claims**



12. In a sawmill,

carriage means for receiving a log,

a pair of charger means operative in a direction toward and away from said carriage means for transporting said log to said carriage means,

means for measuring the diameter of said log,

and backstand means operated by said log for detecting the proper position of said log and for interrupting movement of said charger means,

including means for positioning said backstand means in accordance with the diameter of said log.

4,204,799

HORIZONTAL WIND POWERED REACTION TURBINE ELECTRICAL GENERATOR

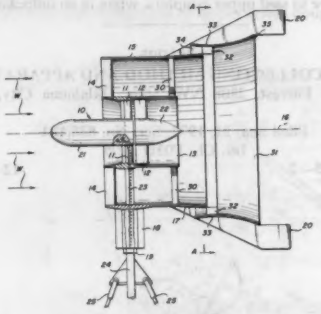
Arie M. de Geus, 6625 - 4th St. South, St. Petersburg, Fla. 33705

Filed Jul. 24, 1978, Ser. No. 927,046

Int. Cl.[2] F03D *1/04*

U.S. Cl. 415—2 **9 Claims**

1. A horizontal wind powered electrical generator comprising, a horizontal reaction turbine comprising overlapping curved stator blades and downwind reversely curved rotor blades disposed within a turbine cowling, an augmentor cowling surrounding said turbine and extending downwind thereof, first stage curved stator blades interconnecting said augmentor cowling with said turbine cowling; said augmentor cowling having a diameter of at least about 2.5 times the diameter of said rotor blades, secondary stator blades spaced downwind from said first stage stator blades and extending inwardly from said augmentor cowling to terminate short of the turbine cowling, said secondary stator blades having a greater angle of departure than said first stage stator blades to increase the rotational velocity of the air passing through the secondary stator blades at the expense of its axial velocity while permitting the air moving inwardly of the secondary stator blades to move with undiminished axial velocity, a venturi-structured diffusor carried by said augmentor cowling in a downwind position to lower the pressure generally and assist the action of the secondary stator blades, and means to pivot the composite structure to keep it facing into the wind.



4,204,800

MULTISTAGE SIDE CHANNEL COMPRESSOR

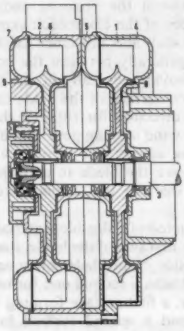
Benedikt Bentele, Bad Neustadt, and Gert Hecht, Bremen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,803

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721233

Int. Cl.[2] F04B *5/00*

U.S. Cl. 415—53 T **3 Claims**



1. In a side channel compressor comprising first and second compressor stages each including first and second housing halves arranged axially in side by side relationship, the second housing half of said first compressor stage and the first housing half of said second compressor being inner adjacently arranged housing halves, each of said inner housing halves having at least one inlet and one outlet opening for forming passages between said compressor stages, the improvement comprising:

said inlet and outlet openings of said inner housing halves being of the same shape and size;

each of said inner housing halves including sealing rims each

arranged in surrounding relationship to one of said inlet and outlet openings of that housing half;

said second housing half of said first compressor stage having a further sealing rim arranged in the circumferential direction ahead of the outlet opening of that housing half, the center-to-center distance between said further sealing rim of said second housing half and the sealing rim surrounding the outlet opening of that housing half being equal to the center-to-center distance between the sealing rims surrounding the outlet and inlet openings of that housing half;

and said first housing half of said second compressor stage having a further sealing rim arranged in the circumferential direction behind the inlet opening of that housing half, the center-to-center distance between said further sealing rim of said first housing half and the sealing rim surrounding the inlet opening of that housing half being equal to the center-to-center distance between the sealing rims surrounding the outlet and inlet openings of that housing half.

4,204,801

SEWAGE PUMP ASSEMBLY

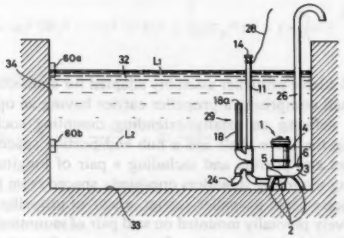
Yohichi Kamo, 3-4-10, Gohongi, Meguro-ku, Tokyo, Japan

Filed Dec. 27, 1977, Ser. No. 864,815

Claims priority, application Japan, Dec. 29, 1976, 51-178155[U]

Int. Cl.[2] **F04D** *29/70;* **F04B** *49/00*

U.S. Cl. 415—121 G **10 Claims**



1. A sewage pump assembly comprising:

(A) a sewage pump having an inlet port;

(B) a substantially vertical pipe connected to said inlet port of the sewage pump, and extending up to a predetermined level relative to said sewage pump, said vertical pipe having a first inlet opening directed upwardly at its top end, and a second inlet opening extending a predetermined length from said top end along said vertical pipe;

(C) discharge pipe means connected to said sewage pump for discharging pumped sewage;

(D) said second inlet opening having a bottom limit which is higher than the bottom of said sewage pump;

(E) connecting means having an inner diameter between said vertical pipe and said sewage pump for connecting therebetween;

(F) said second inlet opening being a substantially vertical slot in said vertical pipe; and

(G) said pipe second inlet extending upwardly and cooperating with said first inlet to form an uninterrupted common inlet therebetween.

4,204,802

SIDE CHANNEL COMPRESSOR

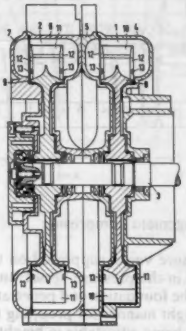
Siegfried Schönwald, and Norbert Schmid, both of Bad Neustadt, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,557

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738208

Int. Cl.[2] **F04D** *5/00, 29/18*

U.S. Cl. 415—213 T **2 Claims**



1. In a side channel compressor, having blades arranged on a rotor said blades having a bevel on the back side at their lateral edges, the improvement comprising a slot-like recess at each blade edge in the entrance region of the blades.

4,204,803

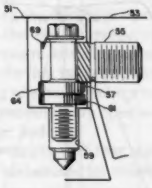
DIAPHRAGM SUPPORT

Donald R. Leger, Westminster; Peter P. Clifford, Leominster, and William N. Matson, Fitchburg, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,799

Int. Cl.[2] **F01D** *25/24*

U.S. Cl. 415—219 R **1 Claim**



1. A support arrangement for supporting an annular diaphragm half into a turbomachine casing comprising:

at least two support lugs threaded into said diaphragm, one from each side of the machine axis centerline; said support lugs extending in a generally radial direction; each support lug having a bifurcated head section extending outwardly from said diaphragm;

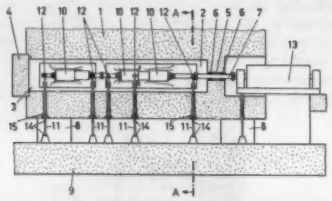
at lease two adjusting bolts threaded into said turbomachine casing, one from each side of the machine axis centerline; said adjusting bolts each including an enlarged bearing platform and a cap portion having a reduced section there between, said reduced section for insertion into the bifurcated head section of its respective lug; and

a locking tab connected to each cap portion for engaging said bifurcated head section whereby said adjusting bolt is locked in place.

4,204,804
TURBOSET SUPPORT

Andrew Woodger, Avondale, New Zealand, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 14, 1978, Ser. No. 877,656
Claims priority, application Switzerland, Mar. 21, 1977, 3483/77
Int. Cl.[2] F01D *25/28*
U.S. Cl. 415—219 R 8 Claims

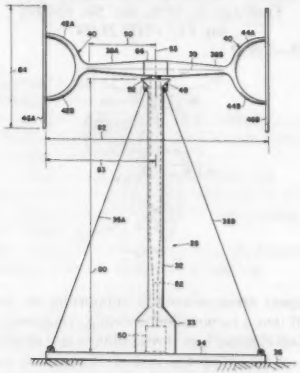


1. A turbine arrangement comprising:
a foundation;
a prestressed pressure vessel supported on the foundation;
a turboset located in the pressure vessel; and
means resting on the foundation and penetrating the pressure vessel in a gas-tight manner for propping the turboset, the propping means being adjustable in height and movable in an axial direction and having locating features for absorbing vertical and tengential motions independently of deformations of the pressure vessel.

4,204,805
VERTICAL AXIS WIND TURBINE

Victor W. Bolie, 7504 American Heritage Dr., Northwest, Albuquerque, N. Mex. 87109

Filed Mar. 28, 1978, Ser. No. 890,998
Int. Cl.[2] F03D *7/06*
U.S. Cl. 416—119 16 Claims

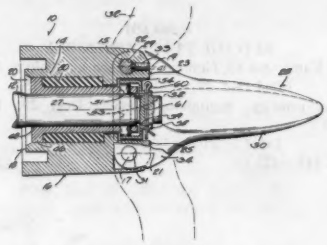


1. A vertical axis wnd turbine, comprising;
(a) a tower structure of selected height H, supported on a base of diameter D, resting on the earth;
(b) a rotating structure having a central hub rotatable on bearing means at the top of said tower, and torque drive means extending from said hub means, down inside of said tower structure to energy control means on said base;
(c) at least two streamlined radial arms, circumferentially equally spaced, and equal in selected length L, extending in a horizontal plane, and wherein each arm is streamlined with its chord plane being horizontal;
(d) a high speed vertical airfoil of selected vertical extend E, attached to the outer end of each radial arm, each airfoil being identical, the chord plane of each airfoil perpendicular to the axis of the arm to which it is attached; and
(e) the outer end of each arm is attached to a U-shaped connector, the two fingers of the U-shaped connector being in a vertical plane, and attached to said vertical airfoil at points E/4 from each end;
whereby the inertial center, the aerodynamic center, and the support center are all at the center of rotation of said hub.

4,204,806
FOLDING PROPELLER

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 9, 1977, Ser. No. 859,052
Int. Cl.[2] B63H *1/24*
U.S. Cl. 416—134 R 4 Claims

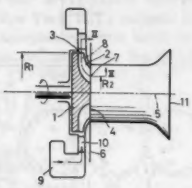


1. A foldable propeller assembly adapted for connection to a drive shaft comprising a propeller carrier having an open end portion defining an axially extending mounting socket for receiving the drive shaft and a hub end portion spaced from said open end portion and including a pair of longitudinally extending mounting shoulders oppositely spaced from the axis of rotation of said propeller carrier, a pair of propeller blades respectively pivotally mounted on said pair of mounting shoulders of said hub end portion for movement from a folded-together, collapsed position to a radially outwardly extending operative position in response to rotation of said propeller carrier and for movement from the operative position to the collapsed position in response to cessation of rotation of said propeller carrier, drive means for drivingly connecting said propeller carrier with the drive shaft for common rotation therewith, said drive means including a sleeve member having an axially extending bore for rotatably receiving the drive shaft, a drive pin engaged with and extending transversely of said sleeve member and adapted for engagement with the drive shaft to establish driving connection therebetween, and a resilient member interposed said mounting socket and said sleeve member for establishing driving connection between said sleeve member and said propeller carrier and for absorbing torque forces transmitted between said propeller carrier and the drive shaft, and retainer means located radially intermediate said pair of mounting shoulders and engageable with said drive pin for retaining said drive pin in engagement with said sleeve member and for preventing axially outward movement of said propeller assembly relative to the drive shaft.

4,204,807
RADIAL TURBINES

Masaaki Takizawa, Mishima, and Shoji Sasaki, Susono, both of Japan, assignors to Toyota Jidosha Kigyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 16, 1978, Ser. No. 887,356
Claims priority, application Japan, Mar. 23, 1977, 52-32463
Int. Cl.[2] F01D *1/08, 5/04*
U.S. Cl. 416—188 **4 Claims**



1. A radial turbine having a turbine blade, the angle of rake of which, relative to a turbine exit surface, perpendicular to the axis of the turbine, at a radius R_2 from the axis of the turbine at the exit portion, and β_2 and is obtained by the following formula:

$$\beta_2 = \tan^{-1}(W_{2a}/W_{2u}),$$

wherein

$$W_{2u} = U_2 - C_{2u} \text{ and } W_{2a} = \sqrt{W_2^2 \quad W_{2a}^2}$$

in which,

W_{2u} and W_{2a} are peripheral and axial components respectively of W_2, which is the velocity of combustion gas relative to the turbine rotor at the circular surface including said radius R_2 at a designated rotor velocity, and,

$$W_2^2 = \psi_2^2 [W_1^2 - U_1^2 + U_2^2 + 2gJC_pT_1(1 - (\frac{P_2}{P_1})^{\frac{\gamma-1}{\gamma}})],$$

in which,

$$\psi_2 = A + B(\frac{R_2}{R_1}) + C(\frac{R_2}{R_1})^2,$$

A, B and C are coefficients,

R_1 = the distance of a turbine entrance portion from the axis of the turbine;

R_2 = the distance between the axis of the turbine and an intersecting point of the turbine exit surface and a cross-section of the turbine blade along a designated line of flow of the combustion gas flowing through a space between two adjacent turbine blades;

W_1 = the relative velocity between the combustion gas and the turbine rotor at the turbine entrance portion and at the designated rotor velocity;

U_1 = the peripheral velocity of the turbine rotor at the turbine entrance portion and at the designated rotor velocity;

U_2 = the peripheral velocity of the turbine rotor at the radius R_2 on the turbine exit surface and at the designated rotor velocity;

g = gravitational acceleration;

J = heat equivalent of work;

C_p = specific heat at constant pressure of the combustion gas;

P_1 = the pressure of the combustion gas at the turbine entrance portion and at the designated rotor velocity;

T_1 = the absolute temperature of the combustion gas at the turbine entrance portion and at the designated rotor velocity;

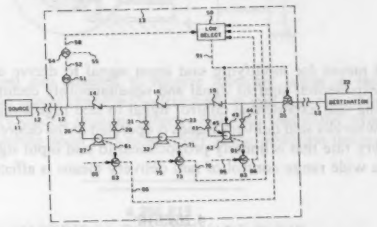
P_2 = the pressure of the combustion gas at the circular surface including said radius R_2 on the turbine exit surface and at the designated rotor velocity;

γ = the ratio of the specific heat at constant pressure of the combination gas to the specific heat at constant volume of the combustion gas.

4,204,808
FLOW CONTROL

Herbert E. Reese, and Hadwen A. Clayton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 27, 1978, Ser. No. 900,636
Int. Cl.[2] F04B *49/00, 49/06*
U.S. Cl. 417—2 **17 Claims**



1. Apparatus comprising:

a primary pumping means having a suction input and a discharge output;

a valve means;

means for connecting said discharge output to said valve means;

means for establishing a first signal which is a function of the pressure at said suction input, said first signal having a first range and a second range, where at least a part of the first range of said first signal is outside the second range of said first signal and at least a part of the second range of said first signal is outside the first range of said first signal;

means for varying the throughput of said primary pumping means in response to the first range of said first signal to maintain the pressure at said suction input within an acceptable range;

means for restricting the discharge through said valve means in response to the second range of said first signal to maintain the pressure at said suction input within an acceptable range, the first range and the second range of said first signal being selected in such a manner that said valve means will be generally fully open when said first signal is in the first range; and

means adapted to supply said first signal to said means for varying and to said means for restricting.

4,204,809
WIDE RANGE CONTROL FOR DELIVERY APPARATUS

Wilbur H. Frazel, Riverside, R.I., assignor to General Signal Corporation, Stamford, Conn.

Filed Dec. 14, 1977, Ser. No. 860,358
Int. Cl.[2] F04B *49/06, 49/00*
U.S. Cl. 417—15 **16 Claims**

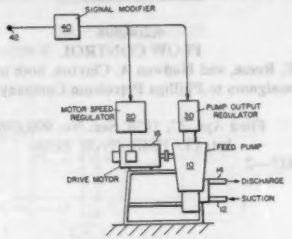
1. An apparatus for delivering a substance to a desired point at a desired delivery rate comprising:

(a) delivery means, including a drive motor and a motor driven variable displacement pump, having at least two independent controls including a motor speed control and a pump displacement control, and operable for delivering the substance to the desired point at a delivery rate proportional to the product of the independent controls;

(b) regulating means operatively associated with said independent controls and responsive to a control signal for regulat-

ing each independent control in proportion to said control signal;

(c) means for providing an input signal indicative of the desired delivery rate; and



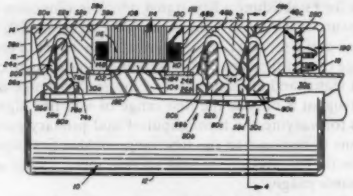
(d) means for modifying said input signal to derive a single, exponential control signal and simultaneously communicating said exponential control signal to said regulating means whereby said delivery means is operated at the desired delivery rate that is linearly proportional to said input signal and a wide range control of said delivery means is affected.

4,204,810

BI-DIRECTIONAL PUMP

John D. Vogel, Parma, Ohio, assignor to Tokheim Corporation, Fort Wayne, Ind.

Filed Nov. 3, 1976, Ser. No. 738,589
Int. Cl.[2] F04D *1/08;* **F01D** *9/02;* **H02K** *3/18, 3/52*
U.S. Cl. 417—244 **45 Claims**



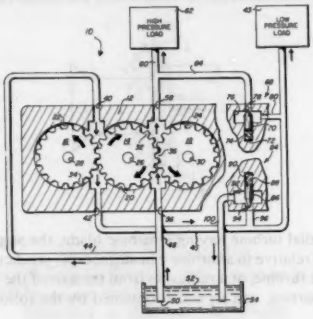
1. A pump comprising a pump housing, said housing having opposite ends, an inlet in one of said housing ends, an outlet in the other of said housing ends, an impeller and a baffle plate within said housing, said impeller being between said inlet and said baffle plate, said baffle plate being between said outlet and said impeller, a shaft extending through said impeller, said shaft having one end thereof journaled in said plate, said impeller being mounted on said shaft for rotation in said housing with said shaft, means for connecting said baffle plate to said housing and spacing said baffle plate from said housing, said connecting and spacing means and baffle plate including means for changing the rotary motion of the fluid leaving said impeller into radially inwardly flow between said baffle plate and said outlet, said impeller being also spaced from said housing, whereby fluid flows into said inlet and engages said impeller adjacent the center thereof and flows radially outwardly of said impeller and over the periphery of and radially inwardly of said baffle plate and into said outlet, said baffle plate having opposite sides, one side thereof facing said impeller, the other side thereof facing said other housing end and said outlet, said changing means including a plurality of vanes extending from adjacent to said shaft radially outwardly therefrom, said vanes being positioned between said baffle plate and said other housing end, said vanes between said baffle plate and said other housing end being integral with said baffle plate, and said connecting and spacing means including slots in said housing and portions of said vanes positioned in said slots.

4,204,811

FLUID PUMPING SYSTEM

William L. Carter, Scottsdale; Jack F. Greathouse, and Philip T. Zeilinger, both of Tempe, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 19, 1977, Ser. No. 826,090
Int. Cl.[2] F04B *47/08*
U.S. Cl. 417—288 **19 Claims**



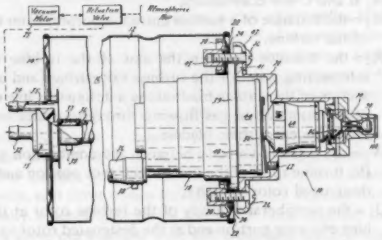
1. A fluid pumping system comprising pumping means for pumping fluid from a fluid supply through a first outlet and a second outlet; a relatively high pressure fluid load coupled to said first outlet; a relatively low pressure fluid load coupled to said second outlet; conduit means for providing a flow path between said first outlet and second outlet; and valve means for controllably opening and closing said conduit means to fluid flow in response to the fluid pressure level in said first outlet to controllably relieve a portion of the fluid flow in said first outlet through said conduit means to supplement the fluid flow in said second outlet and prevent the pressure level in said first outlet from exceeding a predetermined level.

4,204,812

VACUUM SYSTEM

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Filed Feb. 22, 1978, Ser. No. 880,285
Int. Cl.[2] F04B *45/00;* **F01L** *21/04*
U.S. Cl. 417—395 **23 Claims**



1. A vacuum device, comprising:

a pump housing having a first inlet adapted to be placed in fluid communication with a source of compressed air and a second inlet adapted to be placed in fluid communication with a vacuum actuated load;

a piston in said pump housing arranged to be powered in a power stroke direction by compressed air supplied to said first inlet, said piston defining a pumping chamber in said housing between said piston and said second inlet;

a return spring biasing said piston in the opposite return stroke direction,

said piston and spring being arranged so that said spring biases said piston in a direction to cause it to draw air into said pumping chamber through said second inlet; and

means responsive to the position of said piston to assist said return spring in completing the return stroke of said piston as it approaches the end thereof.

4,204,813

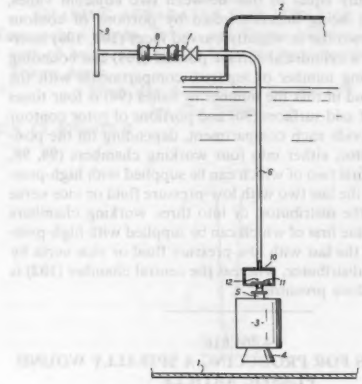
LNG PUMP ANTI-SLAM DEVICE

Edmund G. Tornay, New York, N.Y., assignor to Energy Transportation Group, Incorporated, New York, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,086

Int. Cl.[2] F04B *21/00, 39/00*

U.S. Cl. 417—435 **4 Claims**



1. In an apparatus for pumping liquefied gas from a container to a receptacle, of the kind including a pump having an inlet and an outlet and with its inlet communicating with the interior of the container, a riser pipe having its lower end communicating with the outlet of the pump, and an openable and closable stop valve interposed between the upper end of the riser pipe and the receptacle, the improvement which comprises flow restrictor means interposed between said lower end of the riser pipe and the outlet of the pump, said flow restrictor means having a first condition of operation in which reverse flow from the riser pipe to the pump is permitted in restricted manner, said flow restrictor means having a second condition of operation in which flow from the pump to the riser pipe is permitted in unrestricted manner.

4,204,814

FUEL INJECTION PUMP WITH ROLLER SHAFT FOR INTERNAL COMBUSTION ENGINES

Max Matzen, Leverkusen, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

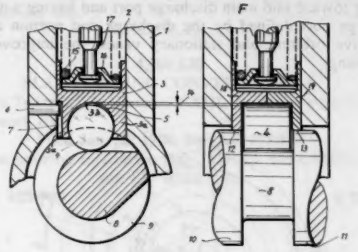
Filed Mar. 21, 1978, Ser. No. 888,753

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712450

Int. Cl.[2] F04B *39/00;* **F16H** *53/06*

U.S. Cl. 417—437 **5 Claims**

1. A fuel injection pump for internal combustion engines, which includes: a pump housing, having a bore, a pump shaft reciprocably mounted in said bore, a camshaft having two axially spaced shoulders, a cam provided between said shoulders, a roller shaft having one end thereof facing said cam provided with two legs defining a recess with a curved inner surface, and a roller with a cylindrical peripheral surface, said roller being rotatably arranged in said recess and protruding therefrom while being in rolling engagement with said cam, the curvature of said curved surface corresponding to the curvature of said cylindrical peripheral surface of said roller, the arrangement being such that in the lower dead center position of said camshaft that portion of said recess surface which is remote from and opposite the contacting area of said roller with said cam describes with said recess surface a crescent shaped gap adapted to receive lubricant while in said lower dead center position the free ends of said legs rest upon said axially spaced sections thereby relieving said roller from pressure acting upon said roller shaft in the direction toward said cam.



4,204,815

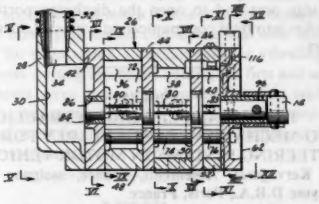
CARTRIDGE ROTARY VANE PUMP

Joseph A. Le Blanc, Glen Ellyn, Ill., assignor to Gast Manufacturing Corporation, Benton Harbor, Mich.

Filed Dec. 6, 1977, Ser. No. 858,017

Int. Cl.[2] F04C *27/02, 23/00*

U.S. Cl. 418—13 **11 Claims**



2. In a rotary vane pump of the type in which a plurality of serially-connected vane carrying rotors are rotatably mounted in a plurality of fluid-connected pumping chambers and in which there is a pump fluid inlet, a pump fluid outlet and a rotary input to the series of rotors, the improvement wherein:

each of said rotors is directly connected to each adjacent rotor, whereby the conventional rotor shaft is eliminated,

each of said rotors includes at least one axially-threaded portion for threaded engagement with a complementary axially-threaded portion of an adjacent rotor, and

at least one spacer integral with one of said adjacent rotors to provide a predetermined axial spacing of said rotors.

4,204,816

DISCHARGE AND PRESSURE RELIEF PORTS FOR MECHANISMS WITH INVOLUTE SHAPED VANES

Thomas W. Bein, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

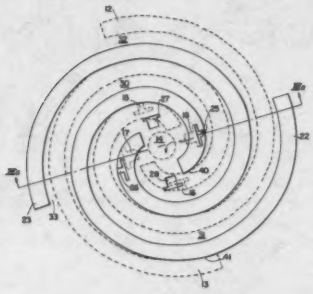
Filed Sep. 8, 1978, Ser. No. 940,528

Int. Cl.[2] F04C *1/02, 15/02*

U.S. Cl. 418—15 **8 Claims**

1. In a positive displacement fluid pump including oppositely disposed interfitting stationary and orbiting members having

end plates with scroll vanes affixed thereto, wherein said stationary member includes a main discharge port for the pump and said orbiting member is driven to orbit with respect to said stationary member so that adjacent interfitting vanes of said opposing members make moving line contacts therebetween to close off and define a moving, fluid pocket of variable volume moving toward said main discharge port and having a normal discharge port defined by the discharge end portion of the respective orbiting and stationary vanes, the improvement comprising:



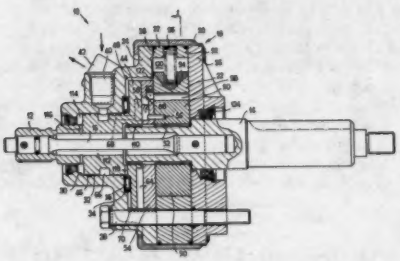
pressure relief means for discharging the fluid in said pocket to said main discharge port through a discharge channel as said pocket approaches closure to prevent overpressurization of the fluid in said closed pocket and for terminating the flow of fluid through said discharge channel as said discharge end portion of a selected orbiting vane moves toward said main discharge port and draws apart from the corresponding stationary vane to form said normal discharge port and to open the discharge portion of said pocket into fluid communication with said main discharge port.

4,204,817

TORQUE-AMPLIFYING HYDRAULIC SERVO-MECHANISM, PARTICULARLY FOR POWER STEERING SYSTEMS IN MOTOR VEHICLES

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Dec. 26, 1978, Ser. No. 973,496
Int. Cl.[2] F01C 1/00
U.S. Cl. 418—248 **6 Claims**



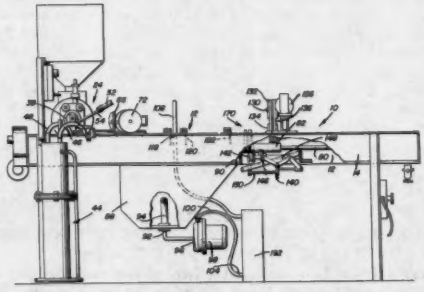
1. A torque-amplifying hydraulic servo-mechanism, particularly for power steering systems in motor vehicles, of the kind including a rotary hydraulic motor and a hydraulic distributor mounted coaxially within a common closed casing, an input shaft connected to a component of the hydraulic distributor, an output shaft connected to the rotary component of the hydraulic motor, and a resilient coupling disposed between the shafts in order to produce a feedback torque on the input shaft so as to indicate the amplified torque delivered to the output shaft, the hydraulic distributor being of the "open centre" kind and controlling the distribution of pressure fluid in the working chambers of the hydraulic motor so as to actuate it in one or the other direction when, and depending on the direction in which, the input shaft is moved through an angle with respect to the output shaft, and the hydraulic motor being of the sliding vane type and comprising two coaxial components namely a stator of cylindrical shape which bears angularly equidistant radially sliding vanes and a rotor whose non-circular shape is designed so as to define with said stator and said vanes a number of variable volume working chambers, characterized in that the shape of the rotor (**50**) of the hydraulic motor comprises at least two angularly equidistant cylindrical surfaces (**90**) in contact with the stator bore and each extending over an arc substantially equal to that between two adjacent vanes, these surfaces being interconnected by portions of contour each having two flat or slightly curved faces (**106, 108**) interconnected by a cylindrical surface portion (**104**) and bounding a corresponding number of separate compartments with the stator bore, and in that the number of vanes (**94**) is four times the number of said surfaces (**90**) and portions of rotor contour so as to subdivide each compartment, depending on the position of the rotor, either into four working chambers (**98, 98, 100, 100**) the first two of which can be supplied with high-pressure fluid and the last two with low-pressure fluid or vice versa by actuating the distributor, or into three working chambers (**98, 102, 100**) the first of which can be supplied with high-pressure fluid and the last with low-pressure fluid or vice versa by operating the distributor, whereas the central chamber (**102**) is at an intermediate pressure.

4,204,818

APPARATUS FOR PRODUCING A SPIRALLY WOUND PLASTIC ARTICLE

Donald J. Reum, P.O. Box B, Albany, Minn. 56307

Division of Ser. No. 755,079, Dec. 28, 1976, Pat. No. 4,120,929.
This application Sep. 18, 1978, Ser. No. 943,185
Int. Cl.[2] B29C 17/00
U.S. Cl. 425—66 **8 Claims**



1. In combination, an assembly for spirally winding a heated thermoplastic strip, a rotary cylindrical member driven at a predetermined speed and partially submerged in a lubricant-coolant bath, means operative to guide a continuous heated strip tangentially toward one end of said cylindrical member, cooled surface guide means adjacent said cylindrical member for selective surface contact cooling of said strip during its movement toward said cylindrical member, stationary continuous multi-convolution spiral guide means defining a stationary spiral guide path between adjacent convolutions of said guide means and concentric about, but spaced from, said cylindrical member and extending from said one end toward the other end of said cylindrical member and with said path including opposite open sides opening radially inwardly toward and radially outwardly away from the outer surface of said cylindrical

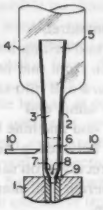
member, said cylindrical member being adapted to have said strip loosely spiraled thereabout in spaced relation relative thereto between the convolutions of said guide means, and variable speed drive means for frictionally engaging and driving said strip at said other end of said cylindrical member from the latter, whereby the drive of the cooled and coiled strip from said other end of said cylindrical member may be transmitted back along the cooled strip coiled about said cylindrical members and serve, together with the tangential feed of said ribbon toward said one end of said cylindrical member to cause the strip, closely adjacent said cylindrical member, to be curved thereabout at least substantially independent of direct contact with said cylindrical member.

4,204,819

SHAPING APPARATUS FOR TUBULAR FILM

Katsuyoshi Ushioda, Tokyo, and Fumio Imaizumi, Chibaken, both of Japan, assignors to Idemitsu Petrochemical Co. Ltd., Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 884,079
Int. Cl.[2] B29D 7/22
U.S. Cl. 425—72 R **2 Claims**



1. An apparatus for shaping olefinic polymer synthetic resins into a tubular film by melt-extrusion into a funnel-like form according to an air-cooling inflation process, said apparatus comprising:

(i) an extrusion die having a circumferential opening through which the resin melt may be extruded, and

(ii) an elongated film stabilizing means extending coaxially upwardly from and connected with the top of said extrusion die, said elongated film stabilizing means comprising

(a) a first section having a bottom end and a top end, and an intermediate wall portion extending between said bottom and top ends,

(b) a second section having a bottom end and a top end and an intermediate wall portion extending between said bottom and top ends in an upwardly diverging direction, said first and second sections being further characterized by the fact that

(1) said second section is positioned above said first section and is joined thereto,

(2) the angle of divergence of the wall portion of said second section being in the range of about 2° to about 15° with the central axis of said elongated film stabilizing means,

(3) the vertical height of said second section being greater than the vertical height of said first section,

(4) the bottom end of said second section has an outer diameter which is nearly the same as the inside diameter of said circumferential opening in said extrusion die,

(5) said first section having a plurality of laterally extending holes located at spaced apart intervals around its circumference,

(6) said first section having a bottom end diameter that is smaller than the inside diameter of said circumferential opening of said extrusion die,

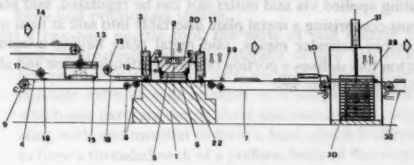
(7) the top end of said second section being open whereby when a tubular plastic film is extruded upwardly through the circumferential opening of said extrusion die a descending flow of pressurized air is formed that passes downwardly through said open top end of said second section and laterally outwardly through said plurality of holes in said first section, and vertically upwardly between the exterior surfaces of said first and second sections and the interior of the freshly extruded tubular film.

4,204,820

SLAB FORMING CONVEYING LINE

Marcello Toncelli, Via Giovanni XXIII, 2 - Bassano del Grappa (Vicenza), Italy

Filed Jan. 30, 1978, Ser. No. 873,144
Claims priority, application Italy, Apr. 22, 1977, 85564 A/77
Int. Cl.[2] B28B 3/02
U.S. Cl. 425—89 **6 Claims**



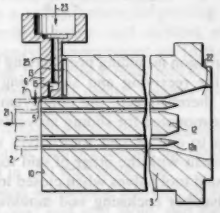
1. An apparatus for the production of resin bonded grit slabs, which comprises means for mixing grit and resin in a predetermined ratio of grit to resin to form a mix, dispensing means for dispensing the mix, conveying means for the mix, means for stretching a first cardboard sheet on said conveying means, said dispensing means depositing said mix onto said first cardboard sheet, means for superimposing a second cardboard sheet on the mix deposited on said first cardboard sheet, whereby the mix is shaped into a slab, a press for compressing the slab, said conveying means conveying said slab into said press, means for maintaining a vacuum and for vibrating said slab in said press, cutting means for cutting the first and second cardboard sheets, oven means for heating the slab, said conveying means conveying said slab successively from said press to said means for cutting the first and second cardboard sheets, then to said oven means.

4,204,821

PROCESS AND APPARATUS FOR THE EXTRUSION OF COATED SKEIN-SHAPED PROFILES, PREFERABLY OF THERMOPLASTIC SYNTHETIC RESINS

Peter Gauchel, Alzenbach, and Waldemar Wissinger, Siegburg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Sep. 24, 1973, Ser. No. 399,982
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246679
Int. Cl.[2] B29F 3/04
U.S. Cl. 425—131.1 **12 Claims**



1. An extrusion device for the extrusion of elongated profiled members made of thermoplastic synthetic resins which

are simultaneously provided with at least one thermoplastic coating of a synthetic resin over at least a portion of their circumferences, said device comprising a primary extruder means for extruding a primary thermoplastic material in the form of an elongated profiled member through an orifice of a main die, at least one accessory extruder means having at least one auxiliary die for extruding at least one coating of a secondary thermoplastic material, said accessory extruder means being disposed closely adjacent to the main die of said primary extruder whereby said at least one coating is continuously extruded onto said member while said member is still within the plastic temperature range, said at least one auxiliary die having an adjustable outlet slot and a distribution zone preceding said outlet slot for effecting distribution of the secondary thermoplastic material for forming a coating, and plate means for adjusting the size of said slot whereby the thickness of the coating applied via said outlet slot can be regulated, said plate means comprising a metal plate insertable into said at least one accessory extruder means, said metal plate having a cutout portion that defines a portion of said distribution zone and also defines said outlet slot.

4,204,822

MOULDING MACHINE

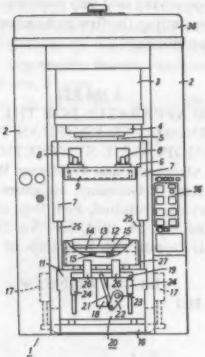
Malcolm Hewitt, Aldridge, England, assignor to British Industrial Plastics Ltd., West Midlands, England

Continuation-in-part of Ser. No. 847,184, Oct. 31, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 952,032

Claims priority, application United Kingdom, Aug. 24, 1977, 35479/77

Int. Cl.[2] **B30B** *15/00*

U.S. Cl. 425—210 **13 Claims**



8. In a compression moulding press having fixed and moving platen means for receiving and supporting the halves of a moulding tool therebetween, the improvement comprising a shroud member mounted for sliding movement around and in sealing relation to one of said tool halves towards and into sealing engagement with the other of said tool halves thereby to define with said tool halves when closed together a substantially closed chamber enclosing said moulding tool, together with actuating means operable to slide said shroud, one of said tool halves having a continuous peripheral piston seal disposed thereon to effect said sealing relation and means operable to at least partially evacuate said closed chamber when so defined.

4,204,823

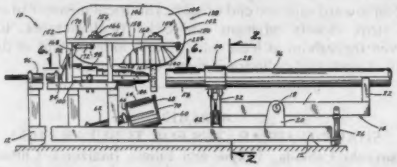
INPLACE GASKET BELLING MACHINE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906-10th Ave., Lewiston, Id. 83501

Division of Ser. No. 902,443, May 3, 1978. This application Mar. 19, 1979, Ser. No. 21,583

Int. Cl.[2] **B29C** *17/00;* **B29D** *23/00*

U.S. Cl. 425—393 **3 Claims**



1. An inplace gasket belling machine comprising a heating bell,

means for supporting said heating bell on said machine for movement toward and onto one end portion of a pipe for heating the same,

an elongated belling mandrel,

means for supporting said belling mandrel on the machine in spaced-apart relation from said heating bell for longitudinal movement toward and into said one end portion of a pipe for belling the same, and

a tilt clamp fixture on said machine for supporting a pipe for pivotal movement between a heating position wherein said heating bell is received on said one end portion and a belling position wherein said mandrel is received within said one end portion.

4,204,824

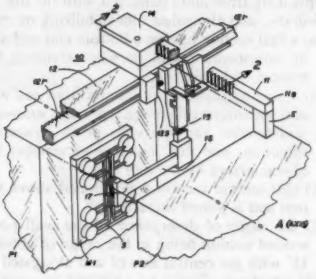
CONTROLLED REMOVAL OF MOLDED PARTS

Joseph R. Paradis, 60 Plymouth Rd., Holden, Mass. 01520

Filed Jul. 24, 1978, Ser. No. 927,146

Int. Cl.[2] **B29F** *1/14;* **B29C** *7/00*

U.S. Cl. 425—436 R **12 Claims**



1. A removal mechanism for use with a molding machine comprising

a removal member;

an actuator for said removal member;

a fixed stop at a prescribed position relative to the molding machine for said removal member;

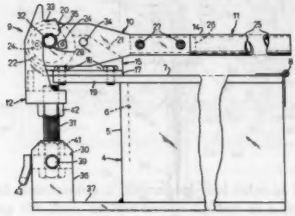
a slippable clutch;

means operated by the opening and closing of said molding machine for operating said actuator through said slippable clutch to achieve precise positioning of said removal member with respect to the mold of said machine independently of variations in the opening and closing of said machine.

4,204,825
FOAM MOLD CLAMP ASSEMBLY

Robert L. Furnas, Wautoma, Wis., assignor to Milsco Manufacturing Company, Brown Deer, Wis.

Filed May 18, 1979, Ser. No. 40,175
Int. Cl.[2] B29C *1/00*
U.S. Cl. 425—451.9 7 Claims



1. In a mold having an upper mold member that is swingable relative to a lower mold member about a hinge at one side of the mold, manually actuatable mechanism by which the upper mold member can be releasably clamped in a closed position overlying the lower mold member and can be moved out of said closed position against a force that tends to maintain it therein, said mechanism comprising:

A. an elongated handle having at one end portion thereof a pivotal connection with said upper mold member at a location on the upper mold member that is spaced from said hinge, said pivotal connection enabling the opposite end portion of said handle to swing about the axis of said connection so that it can move from a clamping position in which the handle overlies the upper mold member to and beyond an intermediate position in which the handle projects away from the upper mold member;

B. a reaction member secured to the lower mold member and having a portion which is upwardly adjacent to said one end portion of the handle when the upper mold member is in its closed position, said portion of the reaction member having

(1) a downwardly facing camming reaction surface and

(2) an upwardly facing fulcrum reaction surface;

C. a cam element on said one end portion of the handle, said cam element being eccentric to said axis and being cooperable with said camming reaction surface to clamp the upper mold member in its closed position upon swinging of the handle to its clamping position; and

D. abutment means on the handle, between said axis and said opposite end portion of the handle, said abutment means being located to engage said fulcrum reaction surface upon swinging of the handle from its clamping position to its intermediate position, so that the handle is fulcrummed as a lever whereby force that swings it further away from its clamping position is applied to moving the upper mold member out of its closed position.

4,204,826
BLOW MOLDING APPARATUS

Johannes Mehnert, Ernststrasse 11, 5203 St. Augustin-Menden, Fed. Rep. of Germany

Continuation of Ser. No. 761,362, Jan. 21, 1977, abandoned, which is a continuation of Ser. No. 647,964, Jan. 9, 1975, abandoned, which is a division of Ser. No. 498,362, Aug. 19, 1974, Pat. No. 3,947,197. This application Feb. 27, 1978, Ser. No. 881,185
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1973, 2342134
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—525 3 Claims

1. Apparatus for forming a hollow body of thermoplastic material, which body is symmetrical and has a threaded neck, comprising:

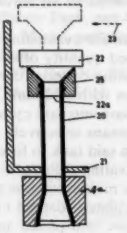
(a) a machine frame,

(b) a blow mandrel having a central longitudinal axis and being mounted on said machine frame for movement along said axis and for movement laterally of said axis between a first position and a second position,

(c) a preforming station mounted on said frame spaced from and in axial alignment with said blow mandrel when it is in said first position, said station including means for applying a preform body of soft thermoplastic material to a blow mandrel within the station,

(d) means for moving said blow mandrel along said axis from said first position into said preforming station for application of a preform body of thermoplastic material and out of said preforming station back to said first position with the preform body attached to said mandrel and extending from said preforming station,

(e) a two-part muzzle tool, the parts of said muzzle tool being individually movable laterally of said axis from a first position in which said parts are spaced and located on opposite sides of said mandrel to a second position in which said parts are united about said mandrel for cooperating with said mandrel to form a head which is effective to form a threaded neck of a preform body of thermoplastic material on said mandrel, the parts of said muzzle tool



being movable with said mandrel along said axis to said first position,

(f) severing means located between said preforming station and said blow mandrel when it is spaced from said preforming station for severing a preform body of thermoplastic material extending from said mandrel to said preforming station,

(g) means for moving said mandrel with the preform body from said first position to said second position,

(h) a molding station comprising a split mold mounted on said frame and spaced from said preforming station for receiving said mandrel with the preform body in said second position, said split mold having interior surfaces which form a cavity, means for moving the portions of said split mold together, said molding station including means for applying compressed air to the blow mandrel for expanding the preform body into conformity with the surfaces forming said cavity, thereby forming a hollow body of thermoplastic material,

(i) means for removing said blow mandrel axially from said molding station, thereby leaving the body of thermoplastic material in said split mold, and

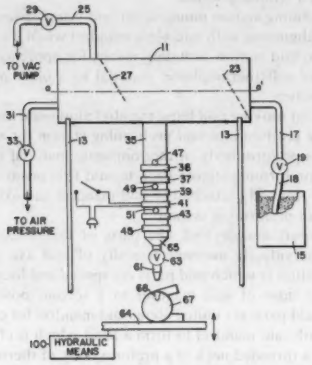
(j) a compressed air-feeding member, including means for attachment over said split mold, said member serving to supply retaining and cooling air into the interior of a hollow body of thermoplastic material with said split mold.

4,204,827

INJECTION MOLDING MACHINE

Ralph H. Romans, 1621 Roosevelt Rd., Owensboro, Ky. 42301

Filed Mar. 2, 1978, Ser. No. 882,608
Int. Cl.[2] B29F 3/08
U.S. Cl. 425—551 **3 Claims**



1. An injection molding machine, comprising:
(a) a supply of particulate plastic material,
(b) a tank supported in an elevated position relative said supply,
(c) vacuum means for evacuating said tank and for drawing a predetermined quantity of said material into said tank,
(d) a hollow heating cylinder connected to a nozzle and in communication with said tank, whereby a portion of said material can pass into said cylinder,
(e) air pressure means selectively applicable to said particulate material in said tank to force said particulate material through said heating cylinder to transform said particulate material into a molten viscous mass.
(f) an adjustable platen adapted to support a mold, and
(g) means to move said platen and said mold thereon into close proximity to said nozzle, the nozzle entering an opening in said mold, whereby said viscous mass is propelled by air pressure to fill said mold.

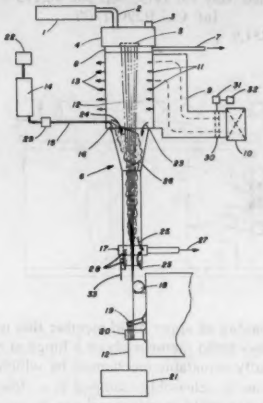
4,204,828

QUENCH SYSTEM FOR SYNTHETIC FIBERS USING FOG AND FLOWING AIR

Frank L. Peckinpaugh, and Raymond J. Biron, both of Colonial Heights, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 1, 1978, Ser. No. 930,119
Int. Cl.[2] D01D 7/00
U.S. Cl. 425—72 S **3 Claims**

1. A quench system for spinning multifilament synthetic fiber using fog and air in a quench stack comprising
a spinnerette for spinning synthetic fiber into a cross-flow quench stack,
a nozzle for airless atomizing of water into fog, said nozzle located about six feet below said spinnerette and emitting said fog into said quench stack,
means for supplying a flow of air to said quench stack,
means to exhaust said air flow from said quench stack,
means to supply water to said nozzle,
means to receive and remove any excess water droplets in said quench stack,
means to control said air flow, and
means to control the pressure of said water supply to nozzle, said spinnerette being located at the entrance of said quench stack, said means for supplying air, means to receive and remove any excess water droplets, means to exhaust air and nozzle all communicating with said quench stack, said means to supply said water communicating with said nozzle, both said means to control operatively connected respectively to said air flow supply means and said water supply means, and said nozzle atomizing and communicating with said quench stack so that no water droplets are formed to directly contact said



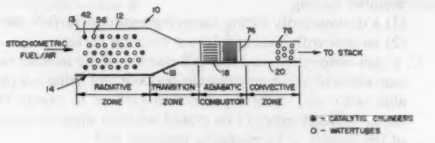
fiber and the quenching of said fiber is due entirely to the effect of said fog in conjunction with said air flow, and one nozzle being provided for each two bundles of multifilament fiber per stack.

4,204,829

CATALYTIC COMBUSTION PROCESS AND SYSTEM

Robert M. Kendall, Sunnyvale; John P. Kesselring, Mountain View, and Wayne V. Krill, Sunnyvale, all of Calif., assignors to Acurex Corporation, Mountain View, Calif.

Filed Apr. 5, 1978, Ser. No. 893,575
Int. Cl.[2] B01J 29/00
U.S. Cl. 431—7 **17 Claims**



1. A process for combusting fuel and oxidizer reactants, comprising the steps of directing a mixture of the reactants along a zone in which bodies having a surface-active material are disposed, combusting reactants about said bodies, and radiating energy from the bodies to heat sinks which are spaced in an array about each of the bodies within the zone, said energy being radiated to the heat sinks at a rate which prevents the temperature of the material from exceeding a predetermined limit, directing the products from the zone in an exhaust stream along a path through a combustor, and adiabatically combusting exhaust stream reactants in the combustor.

4,204,830

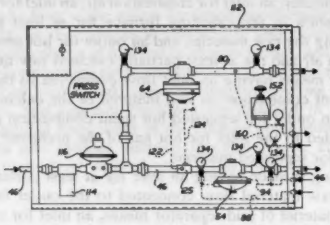
METHOD AND APPARATUS FOR CONTROLLING BURNER-AIR-FUEL RATIO

William M. Jones, Parma, and Mark S. Freas, Cleveland, both of Ohio, assignors to The North American Manufacturing Company, Cleveland, Ohio

Filed Aug. 26, 1977, Ser. No. 827,931
Int. Cl.[2] F23C 5/00
U.S. Cl. 431—8 **41 Claims**

1. A method of controlling the air-fuel ratio for a burner,

said method comprising the steps of establishing a primary flow of air to the burner, establishing a flow of fuel to the burner, simulating the primary air flow with a secondary air



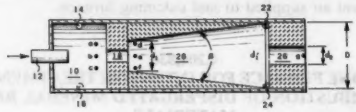
flow, and maintaining a desired air-fuel ratio at the burner by regulating the flow of fuel to the burner as a function of the secondary air flow.

4,204,831

FUEL BURNER USEFUL FOR CARBON BLACK PRODUCTION

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1978, Ser. No. 893,378
Int. Cl.[2] F23M *3/04*; C09C *1/50*
U.S. Cl. 431—10 **7 Claims**



1. A burner apparatus comprising
(a) a cylindrical first section adapted with axial fuel inlet and at least one tangential combustion supporting gas inlet;
(b) a frustoconical second section aligned axially downstream of said first section and having the largest diameter at the downstream end with at least one tangential combustion supporting gas inlet located in the downstream portion, said combustion supporting gas inlet of the same rotational relationship as in the cylindrical section;
(c) means forming an axially aligned restrictive opening between said first and second sections; and
(d) a member blocking the largest diameter portion of said frustroconical second section, said member having a planar surface in juxtaposition with the downstream end of said second section, an axially aligned outlet opening in said member beginning at said planar surface, said outlet of greater diameter than said restrictive opening and of lesser diameter than the upstream end of said second section.

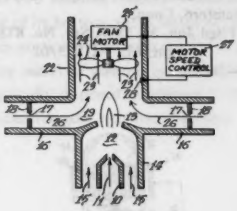
4,204,832

GAS BURNER DEVICE

Robert F. Miller, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Aug. 10, 1978, Ser. No. 932,515
Int. Cl.[2] F23N *3/00*
U.S. Cl. 431—20 **7 Claims**

1. A gas burner device, comprising: a gas supply means; a gas burner receiving gas from said gas supply means; a primary air supply duct means for supplying primary air to said burner; a secondary air supply duct means for supplying secondary air to said burner, said primary air supply and secondary air supply maintaining combustion of said gas to produce a flame; a flue gas vent means leading from said burner and flame for venting flue gases to a place of disposal; a power driven fan means communicating with said flue gas vent means for providing simultaneously a forced flow of flue gases away from said flame and of said primary and secondary air to said flame; a temperature responsive variable speed control for controlling the power supplied to said motor and thereby the speed of said



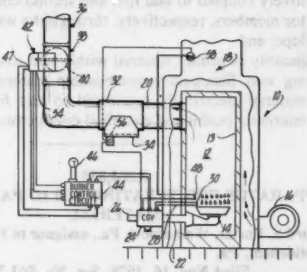
fan; and a flue gas temperature sensor means in said flue gas vent operatively connected to said motor speed control for controlling the speed of the fan and thereby simultaneously the rate of flow of the flue gases and the primary and secondary air by said fan in direct relation to the temperature of said flue gases.

4,204,833

SAFETY CONTROL FOR FURNACE BURNER

Edward R. Kmetz, Grosse Pointe Park, and George E. Joumas, St. Clair Shores, both of Mich., assignors to Scotty Vent Dampers, Hazel Park, Mich.

Filed Feb. 6, 1978, Ser. No. 875,328
Int. Cl.[2] F23N *5/24*
U.S. Cl. 431—22 **8 Claims**



1. In combination, a safety control arrangement and a combustion heating device of the type having a burner ignition safety circuit detecting ignition of the fuels burned within the combustion chamber of the heating device, the combustion heating device further having an exhaust vent means for exhausting the products of combustion of said combustion chamber, said exhaust means including a draft opening having an inlet to induct air into said exhaust means, said safety control arrangement comprising:
a temperature sensor located in said draft opening inlet, comprising a lineal sensor consisting of a sensor tube extending about said inlet to sense spillage of combustion gases therethrough at any point along the periphery of said inlet;
control means responsive to the sensing of an abnormal temperature condition by said temperature sensor in the exhaust vent means causing said burner ignition safety circuit of said heating device to be activated;
whereby said burner ignition safety circuit also acts as a safety shutdown of burner operation in the event an ab-

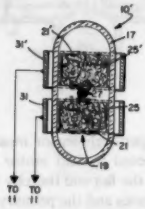
normal temperature condition develops in said exhaust vent means.

4,204,834

LEADLESS ELECTRIC FLASH LAMP

Timothy Fohl, Carlisle, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,258
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—362 **17 Claims**



1. An electrically-activated flash lamp for use within a reflective assembly having first and second spaced-apart electrically conductive reflector members, said flash lamp comprising:

a hermetically-sealed, light-transmitting envelope including a combustion-supporting atmosphere therein;

a quantity of filamentary combustible material within said envelope;

first and second spaced-apart electrical conductors positioned on the internal surface of said envelope, said first and second electrical conductors adapted for being capacitively coupled to said first and second conductive reflector members, respectively, through the wall of said envelope; and

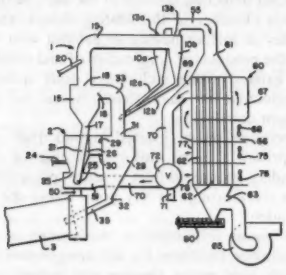
a quantity of primer material within said envelope for igniting said filamentary combustible material, said primer material electrically connected to said first and second internally positioned electrical conductors.

4,204,835

APPARATUS FOR TREATING SOLID PARTICULATE MATERIAL

Edward S. Porter, Walnutport, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Nov. 16, 1978, Ser. No. 961,316
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—58 **4 Claims**



1. Apparatus for manufacturing cement clinker comprising:

a preheater having an inlet for raw material, an inlet for hot gas, an outlet for preheated raw material and an outlet for gas;

a calcining furnace having an inlet for preheated raw material flow connected to the outlet for preheated raw material of the preheater, an inlet for combustion air, an inlet for fuel for combustion in the calcining furnace for at least partially calcining the raw material, and an outlet for hot spent combustion air and the at least partially calcined raw material;

separator means having an inlet flow connected to the outlet for spent combustion air and material of the calcining furnace, an outlet for separated hot spent combustion air flow connected to the inlet for hot gas of the preheater and an outlet for separated material;

a clinkering furnace having an inlet for at least partially calcined raw material flow connected to the outlet for separated material of said separator means, an inlet for combustion air, an inlet for fuel for combustion in the clinkering furnace, an outlet for spent combustion air and an outlet for cement clinker;

an indirect heat exchanger;

conduit means flow connecting the outlet for gas of said preheater with said indirect heat exchanger, means for supplying ambient air to the indirect heat exchanger for indirect heat exchange with gas from said preheater to thereby heat the ambient air;

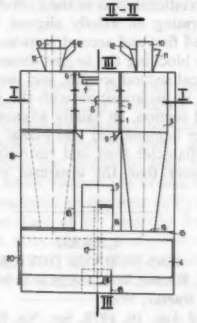
means for supplying the thus heated ambient air to the inlet for combustion gas of the calcining furnace; and conduit means for by-passing heated ambient air to atmosphere and valve means in said means for supplying heated ambient air from the indirect heat exchanger to the inlet for combustion gas of the calcining furnace for controlling the volume of heated ambient air supplied to said calcining furnace.

4,204,836

CYCLONE FURNACE FOR INTENSIVE TREATMENT OR COMBUSTION OF DISPERGATED MINERAL RAW MATERIALS

Edmund Nowak, Kraców; Rudolf Zamojdo, Wroctaw; Andrzej Parda; Wiestaw Kurdowski, both of Kraców, and Stefan Jankowski, Wroctaw, all of Poland, assignors to Instytut Przemyslu Maszyn Wiazacych Materialow Budowlanych, Opole, Poland

Filed Oct. 5, 1978, Ser. No. 948,995
Int. Cl.[2] F27B *15/00*
U.S. Cl. 432—58 **6 Claims**



1. A cyclone furnace for intensive treatment or combustion of dispergated mineral raw materials, comprising essentially, in a vertical arrangement, a cyclone reaction chamber; said chamber having means therewith for supplying heat energy into said chamber; discharge means disposed at a lower portion of said chamber for discharge of furnace products, a through precipitation chamber adopted to receive melted non-gaseous portion of treated material, said reaction chamber being provided with separate openings for draining off melt and an

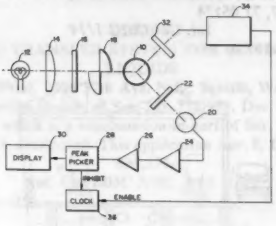
outlet for gases, wherein: said furnace being defined by a separate, essentially in horizontal arrangement, cyclone fuel combustion chamber with a two-sided outlet for products, enclosed with a cylindrical side wall to secure an essentially circular form of a cross-section of said chamber, and two non-cylindrical opposite front walls; means for supplying of energy-formation agents on the cylindrical side wall of said chamber by a tangential supplying of fuel and an oxygen carrier, and profiled outlets of combustion products from the cyclone chamber into at least two known and vertically disposed cyclone reaction chambers, said reaction chambers are disposed in opposite non-cylindrical front walls of the cyclone combustion chamber, both said cyclone reaction chambers being connected directly to the front walls of said cyclone combustion chamber and are provided with means for supplying said chambers with dispergated, mineral raw material, disposed axially on an upper cover; and in a narrowing portion from below there being outlets for gaseous and non-gaseous furnace products directly connected to said precipitation chamber, and said chamber connecting at least two reaction chambers whereby from the lowermost portion of its bottom, there being an outlet for the melted non-gaseous portion of the furnace products, and oppositely at the top the outlet of gaseous products there are provided, outlets centrically disposed in relation to the outlets of the process products from the reaction chambers.

4,204,837

METHOD OF RATE IMMUNONEPHELOMETRIC ANALYSIS

James C. Sternberg, Fullerton, and John E. Lillig, Diamond Bar, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 14, 1978, Ser. No. 886,493
Int. Cl.[2] G01N *31/00, 33/16, 21/00*
U.S. Cl. 23—230 B **19 Claims**



1. In a method of nephelometric analysis wherein antigen and antibody reaction components are reacting in a first reaction and a rate signal is generated as a time rate of change of a nephelometric signal developed from the first reaction, the peak value of the rate signal providing a measure of a characteristic of one of the reaction components in the first reaction, the improvement comprising the steps of:

establishing a range of peak values for which a measured peak value will provide an ambiguous measure of the characteristic of the one reaction component, a measured peak value within the range of peak values providing an acceptable measure of the characteristic if the first reaction is in antibody excess;

measuring a first peak value of the rate signal while the first reaction is proceeding; and

comparing the measured peak value with the range of peak values to determine the existence of an ambiguity in the measured characteristic indicated by the first peak value whereby subsequent addition of a reaction component to the first reaction may be utilized to establish the antigen or antibody excess condition of the first reaction if the comparing step indicates an ambiguity in the measured characteristic.

4,204,838

METHOD OF ANALYSIS

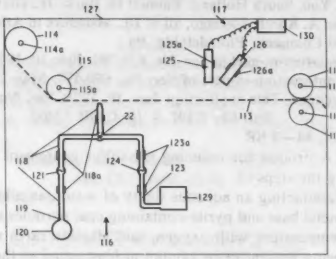
John H. Atherton; Derrick C. Dobson; Ian Hodgkinson, all of Manchester, and John R. P. Clarke, Runcorn, all of England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Jun. 1, 1978, Ser. No. 911,515
Claims priority, application United Kingdom, Aug. 6, 1977, 23910/77
Int. Cl.[2] G01N *21/22, 31/06, 31/22*
U.S. Cl. 23—230 R **8 Claims**

1. A method for the detection of a soluble substance dissolved in a liquid which also contains particular matters suspended therein, comprising the steps of:

adding at least a portion of the liquid to one side of a single continuously moving homogeneous strip of a porous leaf material capable of separating by diffusion the liquid from the particulate matter; and

examining the surface of the tape downstream from the area at which the liquid was applied and in a detection area on the strip into which the liquid has diffused away from the particulate matter, said examining being accomplished utilizing a non-contact detector.

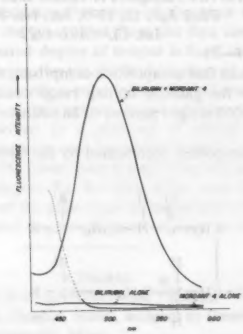


4,204,839

FLUORIMETRIC ANALYSIS METHOD FOR BILIRUBIN

Tai-Wing Wu, Rochester, and Sheryl S. Sullivan, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1978, Ser. No. 932,158
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **20 Claims**



1. A fluorimetric method for the analysis of bilirubin in an aqueous liquid wherein said liquid and an interactive, polymeric mordant composition for bilirubin are contacted together to mordant bilirubin, said interactive, polymeric mordant composition having binding sites for bilirubin and comprising repeating units having a hydrophobic organic matrix and at least one charge-bearing cationic group, the novel step comprising

subjecting the mordanted bilirubin to activating radiation effective to excite the mordanted bilirubin and produce detectable fluorescence indicative of the presence or concentration of bilirubin in said liquid.

4,204,840

PROCESS FOR REMOVING SULFUR FROM COAL

Jin S. Yoo, South Holland; Emmett H. Burk, Jr., Glenwood, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 876,784, Feb. 10, 1978, which is a continuation-in-part of Ser. No. 690,477, May 27, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 916,667

Int. Cl.[2] C10L *9/10*; C10B *57/00*

U.S. Cl. 44—1 SR 18 Claims

10. A process for reducing the sulfur content of coal comprising the steps of:

(1) contacting an aqueous slurry of water, an alkaline earth metal base and pyrite-containing coal particles at elevated temperature with oxygen, said alkaline earth metal base being present in an amount at least equal to the stoichiometric amount of pyrite, and said aqueous slurry being maintained at a pH of from 5.5 to 12.0; and

(2) contacting the slurry of coal particles with hydrocarbon oil to form coal-oil agglomerates; and

(3) recovering coal-oil agglomerates wherein the coal has reduced sulfur content.

4,204,841

DETERGENT GASOLINE COMPOSITION

Joseph B. Biasotti; Peter Dorn, both of Lagrangeville; Sheldon Herbstman, Spring Valley, and Kenneth L. Dille, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

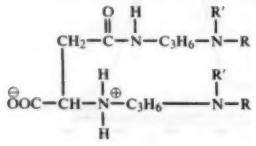
Filed Apr. 19, 1979, Ser. No. 31,556

Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—71 7 Claims

1. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing from about 0.001 to 0.003 weight percent of an additive composition comprising

(A) a component represented by the formula:



in which R is a primary aliphatic hydrocarbon radical having from about 6 to 30 carbon atoms and R′ is a hydrogen or a methyl radical, and

(B) an N-alkyl-alkylene diamine component represented by the formula:

$$R,R'—N—C_3H_6—NH_2$$

in which R is a primary aliphatic hydrocarbon radical having from about 6 to 30 carbon atoms and R′ is hydrogen or a methyl radical, said additive composition consisting of from about 30 to 70 weight percent of said component A and the balance said component B based on diluent free materials.

4,204,842

PROCESS FOR CONVERTING BIODEGRADABLE WASTES INTO INDUSTRIAL GASES

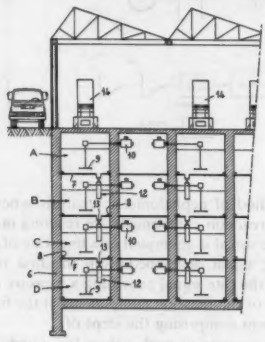
Pierre Morel, 57, avenue Sainte Marie, Saint-Mande, Vel de Marne; Yasmine Ortega, 19 bis, rue Martin Basse, Caluire; Claudette Jullien, and Antonin Jullien, both of 1, rue Henri Gorjus, Lyons 4eme, all of France

Continuation of Ser. No. 783,476, Mar. 31, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,451

Claims priority, application France, Apr. 1, 1976, 76 10364; Feb. 17, 1977, 77 05174

Int. Cl.[2] C02C *1/14*

U.S. Cl. 48—197 A 11 Claims



1. A process for converting organic wastes into industrial gases, comprising the steps of:

collecting and comminuting biodegradable waste material;

admixing the comminuted waste material in a first cell with a liquid containing methane-producing bacteria to form a fermentable sludge;

oxygenating said sludge in said first cell by injection of air with concurrent agitation;

thereafter establishing an anaerobic atmosphere around said sludge by introducing carbon dioxide into said first cell;

subsequently transferring the sludge from said first cell into a second cell for prefermentation with predominant evolution of carbon dioxide;

thereafter transferring the sludge from said second cell into a final cell for fermentation with predominant evolution of methane; and

extracting at least part of the liquid in the sludge of said final cell for recirculation to said first cell while recovering the methane therefrom.

4,204,843

GASIFICATION PROCESS

Richard C. Neavel, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 19, 1977, Ser. No. 861,824

Int. Cl.[2] C10J *3/00*

U.S. Cl. 48—210 10 Claims

1. A process for gasifying coal containing less oxygen in an active form than would be required to impart from about 2 to about 10 weight percent calcium ion to produce a fuel gas, which consists essentially of:

(a) contacting and soaking said coal with a solution comprising a Group I-A metal hydroxide at a temperature within the range from about 20° to about 200° F. to increase the concentration of ion-exchange sites within said coal as contrasted with the state of the coal prior to contact with said solution and to incorporate from about 1 weight percent to about 10 weight percent of Group I-A metal cations, then

(b) contacting the coal from step (a) with a Group II-A

metal compound at a temperature within the range from about 20° to about 200° F. to exchange and replace a portion of the Group I-A metal cations and to incorporate from about 0.5 to about 6.0 weight percent of one or more Group II-A metal cations, thereby producing a treated coal containing from about 0.5 to about 4.0 weight of a Group I-A metal and from about 0.5 to about 6.0 weight percent of a Group II-A metal and then

(c) gasifying said treated coal at gasification conditions in a gasification zone to produce fuel gas.

4,204,844

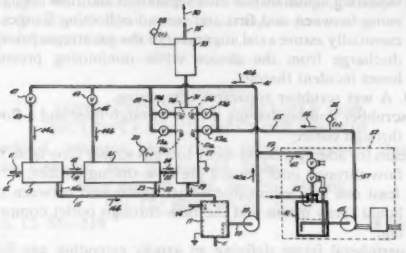
LIQUID TRANSFER SYSTEM FOR CONDUCTIVE LIQUIDS

Michael J. Pilat, 7306 57th Ave. N.E., Seattle, Wash. 98115

Continuation-in-part of Ser. No. 752,988, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 492,157, Jul. 26, 1974, abandoned. This application Apr. 6, 1978, Ser. No. 894,179

Int. Cl.[2] B03C *3/01, 2/16, 3/84*

U.S. Cl. 55—10 **17 Claims**



1. A method of transferring a conductive liquid at a first electrical potential from a supply to receiving equipment which charges the liquid to a second electrical potential, and electrically isolating the liquid at said second potential from the liquid at said first potential, comprising the steps of:

(a) introducing liquid from said supply into an electrically nonconductive container through a spray means in an interrupted stream;

(b) electrically isolating said container from said first potential;

(c) transferring the liquid from said container to said receiving equipment through a pump;

(d) electrically isolating said pump from said first potential.

11. In an electrostatic gas scrubber having means for imposing an electrostatic charge upon particulate matter contained in a gaseous stream, means for introducing said gaseous stream into a spray chamber, and liquid spray means to disperse droplets of a conductive liquid into said chamber, said liquid having an electrostatic charge imposed thereon whereby said gaseous stream contains charged liquid droplets, the improvement comprising a system for recycling said conductive liquid, said improved recycling system including;

an electrically grounded collecting means for collecting said conductive liquid from said spray chamber;

a sump constructed of nonconductive material and isolated from ground and having an inlet and an outlet therein;

transfer means positioned and arranged with respect to said collecting means and said sump to transfer said liquid from said collecting means to said sump, said transfer means including spray means positioned and arranged with respect to said inlet to inject said liquid from said grounded collecting means into said sump along a nonconductive flow path;

gas flow means for introducing a stream of nonconductive gas into said sump through said inlet to prevent the buildup of conductive liquid on the portions of said sump adjacent said inlet; and,

mechanical pump means isolated from ground for transferring said conductive liquid from said sump to said liquid spray means in said spray chamber, said pump having a suction inlet in fluid communication with said outlet.

4,204,845

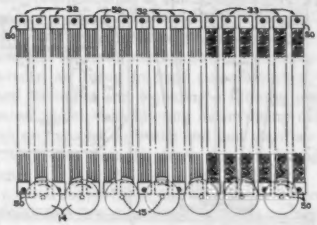
METHOD OF HEAT TREATING MOVING GLASS SHEETS ON MODIFIED GAS BED

George B. Shields, Lower Burrell, and Eugene W. Starr, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 25, 1978, Ser. No. 945,718

Int. Cl.[2] C03B *27/00*

U.S. Cl. 65—25 A **5 Claims**



1. A method of tempering glass sheets comprising:

heating a glass sheet to a temperature sufficient for tempering;

passing the heated glass sheet through a first cooling zone wherein each of the opposite surfaces of the glass sheet is subject to a plurality of thin, discrete, spaced-apart, parallel, laminar streams of relatively cool tempering medium angularly directed toward the glass surface so as to cool each portion of the glass sheet passing therethrough at a relatively high rate of heat transfer to rapidly harden the surfaces of the glass sheet and thereby substantially reduce subsequent formation of optical distortion in the glass, exposing each portion of the glass sheet to the laminar streams for a sufficiently limited period of time to substantially avoid inducing fluttering of the glass sheet, and withdrawing the glass sheet from the first cooling zone before the desired degree of temper is fixed in the glass;

immediately passing the incompletely tempered glass sheet from the first cooling zone into a second cooling zone wherein each of the opposite major surfaces of the glass sheet is subjected to a plurality of diffuse patterned streams of relatively cool tempering medium which provide a relatively lower heat transfer rate and a relatively flutter-free support for the glass sheet, and maintaining each portion of the glass sheet in the second cooling zone until the desired degree of temper is fixed in the glass.

4,204,846

SELF-CLEANING AIR FILTER

David L. Brenholt, Dundas, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed May 26, 1978, Ser. No. 909,840

Int. Cl.[2] B01D *46/04*

U.S. Cl. 55—272 **29 Claims**

1. Self-cleaning apparatus for removing particulate material from air comprising:

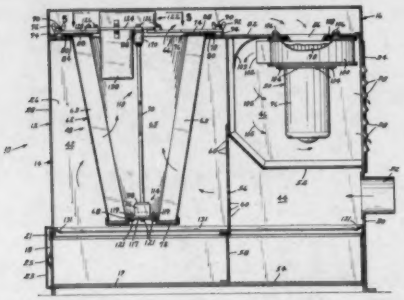
(a) a housing having an air inlet and an air outlet;

(b) filtering means comprising a hollow frusto-conical shaped filter;

(c) said filter having an outer surface, an open interior, opposite open ends with one of said ends having a larger diameter than the other end, and a longitudinal axis extending between the ends;

(d) said filter being formed of a pleated pourous media;

(e) means for removably securing the end with the larger diameter within said housing;
(f) a closure plate secured to and sealing the other end;
(g) means defining a first chamber around the outer surface of said filter, said first chamber being in communication with said air inlet whereby air moving from said inlet to said outlet passes through said filter into the interior thereof and deposits particulate material on said outer surface of the filter;
(h) means for removing particulate material collected on the outer surface of said filter by twisting said filter;
(i) means for biasing said filter to a neutral position wherein said filter is in an untwisted condition; and



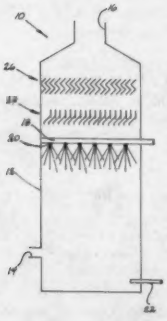
(j) said removing means including a rotatable rod having a longitudinally extending axis, said rod extending from said plate in a direction generally transverse to a major face of said plate, means for drivingly coupling said rod to said plate, camming means engaging said rod for rotating said rod from said neutral position of said rod in a first rotative direction through an angular displacement less than 90° and for rotating said rod from said neutral position in an opposite rotative direction through an angular displacement less than 90°, said coupling means transferring the rotary motion of said rod to said plate while permitting said rod to move transversely of said major face of the plate, and a drive motor for driving said camming means.

4,204,847

MIST ELIMINATOR DEVICE FOR A WET SCRUBBER APPARATUS

Raymond Ko, Ontario, Canada, assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Jun. 5, 1978, Ser. No. 912,756
Int. Cl.[2] B01D *47/06, 45/06*
U.S. Cl. 55—257 PV **12 Claims**



1. A mist eliminator device for removing liquid or a liquid slurry from a gas stream passing therethrough, comprising:
a peripheral frame defining an axially extending gas flow aperture therethrough;
a plurality of elongated baffle members disposed in parallel spaced apart relationship transversely across the gas flow aperture of the peripheral frame and defining a plurality of axially extending gas flow passages, each passage having a gas inlet and a gas outlet; and,
each elongated baffle member having an upstream wall section extending from a respective one of said gas inlets and being inclined to the transverse plane of the peripheral frame, a flow straightening downstream wall section continuing from the upstream wall section to a respective one of said gas outlets and being oriented perpendicularly to the transverse plane of the peripheral frame, a first collecting flange on one side thereof extending toward said respective gas inlet from the downstream wall section proximate the junction of the upstream and downstream wall sections, and a second collecting flange on the other side thereof axially intermediate of the downstream wall section and extending obliquely therefrom in a plane generally parallel to the upstream wall section and being spaced from said first collecting flange, thereby accommodating simultaneous mist separation and flow straightening between said first and second collecting flanges to essentially assure axial alignment of the gas stream prior to discharge from the device while minimizing pressure losses incident thereto.

11. A wet scrubber apparatus comprising:
a scrubber housing having a flow-through inlet and a flow-through outlet;
means for adding a liquid spray to a gas stream flow from the flow-through inlet toward the flow-through outlet;
at least one mist eliminator device positioned between the liquid spray means and the flow-through outlet comprising;
a peripheral frame defining an axially extending gas flow aperture therethrough;
a plurality of elongated baffle members disposed in parallel spaced apart relationship transversely across the gas flow aperture of the peripheral frame and defining a plurality of axially extending gas flow passages, each passage having a gas inlet and a gas outlet; and,
each elongated baffle member having an upstream wall section extending from a respective one of said gas inlets and being inclined to the transverse plane of the peripheral frame, a flow straightening downstream wall section continuing from the upstream wall section to a respective one of said gas outlets and being oriented perpendicularly to the transverse plane of the peripheral frame, a first collecting flange on one side thereof extending toward said respective gas inlet from the downstream wall section, and a second collecting flange on the other side thereof axially intermediate of the downstream wall section and extending obliquely therefrom in a plane generally parallel to the upstream wall section; and,
the mist eliminator device being oriented within the scrubber housing with the transverse plane of the peripheral frame disposed perpendicularly to the gas stream flow moving toward the mist eliminator device.

4,204,848

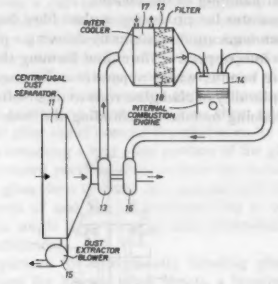
AIR FILTER INSTALLATION

Robert Schulmeister, Friedrichshafen; Franz Edmaier, and Günther Kiefer, both of Markdorf, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,522
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738293
Int. Cl.[2] B01D *45/18*
U.S. Cl. 55—269 **6 Claims**

1. An air filtering installation for an internal combustion engine having a supercharging compressor and a supercharger

inter-cooler means for cooling intake air for the engine, the air filter installation comprising a centrifugal dust separator means and a dry air filter means with an interchangeable filter insert,



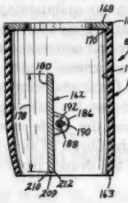
characterized in that the centrifugal dust separator means is arranged on a suction side of the supercharging compressor and the dry air filter means is arranged downstream of the supercharger inter-cooler means.

4,204,849

DISCHARGE VALVE ASSEMBLY FOR MULTIPLE-STAGE DUST COLLECTOR

Gordon L. Johnston, Maple Grove, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Aug. 30, 1978, Ser. No. 938,006
Int. Cl.[2] B01D *46/48, 50/00*
U.S. Cl. 55—310 **18 Claims**



1. A dust separator and discharge valve assembly comprising:

means for separating dust from dust-laden air, including a dust-laden air inlet and a clean air outlet;

collection means for collecting dust separated by said separating means from said dust-laden air, said collection means being attached to and in communication with said separating means;

said collection means including at least one conduit, said at least one conduit having an open inlet end, an open outlet end, and a rotatable valve member disposed within the at least one conduit between said inlet and outlet ends;

said at least one conduit being formed of an elastic material having a generally circular cross section and an inner diameter in an unstretched condition;

said rotatable valve member having a generally circular cross section and an outer diameter greater than said inner diameter; and

means for rotating said valve member about an axis spaced from a line bisecting said valve member between a closed position wherein said valve member is substantially perpendicular to a longitudinal axis of said at least one conduit and dust can collect within said at least one conduit above said valve member and an open position wherein said valve member is not perpendicular with the longitudinal axis of said at least one conduit and dust is free to fall downwardly past said valve member through said open outlet end.

10. A multiple-stage dust collector comprising:

a housing;

dust separating means supported in said housing, including first, second and third dust separator mechanisms;

said first dust separator mechanism for separating dust from dust-laden air including a first air inlet for receiving dust-laden air from a source, a first air outlet and a first dust outlet for discharging dust separated by said first dust separator mechanism;

said second dust separator mechanism for separating dust from dust-laden air including a second air inlet connected in fluid communication to said first air outlet, a second air outlet and a second dust outlet for discharging dust separated by said second dust separator mechanism;

said third dust separator mechanism for separating dust from dust-laden air being in fluid communication with said second air outlet and including a filtering means and a clean air outlet, said filtering means being disposed between said second air outlet and said clean air outlet for removing dust particles from the air passing therebetween;

a first conduit supported in said housing and in communication with said first dust outlet, said first conduit having a first open inlet end and a first open outlet end, said first conduit being formed of an elastic material having a generally circular cross section and a first inner diameter in an unstretched condition;

a first rotatable valve member disposed in said first conduit at a location between said first open inlet and outlet ends, said first rotatable valve member having a generally circular cross section and a first outer diameter greater than said first inner diameter;

a second conduit supported in said housing and in communication with said second dust outlet, said second conduit having a second open inlet end and a second open outlet end, said second conduit being formed of an elastic material having a generally circular cross section and a second inner diameter in an unstretched condition;

a second rotatable valve member disposed in said second conduit at a location between said second open inlet and outlet ends, said second rotatable valve member having a generally circular cross section and a second outer diameter greater than said second inner diameter;

means for rotating said first and second valve members between closed positions wherein each valve member stretches a respective conduit and forms a seal around a 360 degree circumferential extent to support dust separated by said first and second separator mechanisms and an open position wherein dust can pass each valve member and be discharged through said outlet ends.

4,204,850

CARBON COATING FOR A STARTING MEMBER USED IN PRODUCING OPTICAL WAVEGUIDE

Ellen K. Dominick, Corning, and George W. Scherer, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 26, 1977, Ser. No. 828,149
Int. Cl.[2] C03C *25/02*
U.S. Cl. 65—3 A **13 Claims**

1. The method of making a preform for an optical waveguide comprising:

providing a substantially cylindrical starting member;

applying a coating of substantially pure particulate carbon to the outside peripheral surface of said cylindrical starting member to form a carbon layer thereon;

applying particulate material to the carbon layer on said starting member to form an adherent coating of glass;

removing said starting member from said glass to cause separation between said carbon layer and the outside

peripheral surface of said starting member or shearing within the carbon layer to produce a preform, and

heating said preform to a temperature which disintegrates said carbon by oxidation and which consolidates said preform.

4,204,851

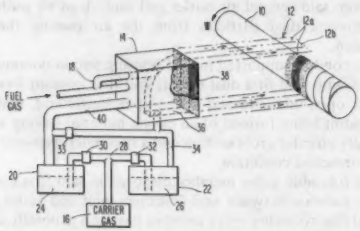
DIRECTING GLASS FORMING CONSTITUENTS AGAINST A LATERAL SURFACE PARALLEL TO THE AXIS OF ROTATION OF A STARTING MEMBER TO FORM A MONOLITHIC BLANK FOR AN OPTICAL WAVEGUIDE

Daniel A. Nolan, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 809,190, Jun. 23, 1977, abandoned. This application Oct. 7, 1977, Ser. No. 840,242

Int. Cl.[2] C03B *37/00*

U.S. Cl. 65—3 A **13 Claims**



1. The method of preparing a monolithic optical waveguide structure including at least one spiral waveguide core, comprising the steps of:

providing a generally cylindrical starting member having a lateral surface parallel to an axis of rotation and having a length L;

rotating said starting member about said axis at a frequency w;

preparing a first constituent in finely divided form;

preparing a second constituent in finely divided form;

entraining said constituents in first and second streams of a carrier fluid, respectively;

directing said constituents toward the lateral surface of said starting member in the form of first and second glass soots, said soots impinging upon said starting member along a spiral locus to form a non-contiguous spiral of said second soot enveloped by said first soot;

said first and second glass soots, when fused, forming glass having first and second indices of refraction, respectively, whereby said second glass soot is in a spiral about said axis.

4,204,852

METHOD OF AND APPARATUS FOR PRODUCING A GLASS FIBRE BUNDLE FOR USE IN OPTICAL COMMUNICATIONS SYSTEMS

Julian K. Watts, and Colin A. Yarker, both of North Wales, England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Jul. 12, 1978, Ser. No. 923,871

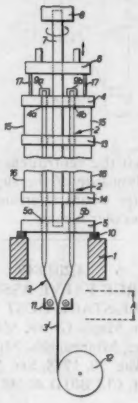
Claims priority, application United Kingdom, Jul. 13, 1977, 29470/77

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—4 A **19 Claims**

1. A method of producing a bundle of optical glass fibres for use in optical communications systems, comprising the steps of: heating to their softening temperature a plurality of parallel, spaced-apart glass rods which each have a cladding of a glass of lower refractive index, drawing the clad glass rods into respective separate fibres, forming the drawn fibres into a bundle of separable fibres, effecting relative rotation between the plurality of clad glass rods and the formed fibre bundle to impart twist to the bundle, and retaining said twist in the bundle to avoid the formation of loops in individual fibres during subsequent handling of the bundle.

12. Apparatus for producing a glass fibre bundle for use in optical communications systems by drawing a plurality of clad glass rods into respective fibres and forming the drawn fibres into a fibre bundle, which apparatus comprises a furnace for heating a plurality of clad glass rods to their softening temperature, a retaining member for holding the rods in a predetermined spaced relationship one to the other, a guide member adjacent the furnace for maintaining the rods in said spaced relationship, the retaining member being movable with respect to the guide member and connected to a drive means for passing the rods into the furnace, means for drawing the softened rods into respective fibres and forming the drawn fibres into a fibre bundle, and means for causing relative rotation of the retaining member and the guide member with respect to the means for drawing the fibres, so as to impart a twist to the fibre bundle as the fibres are drawn from the rods and formed into the bundle.



4,204,853

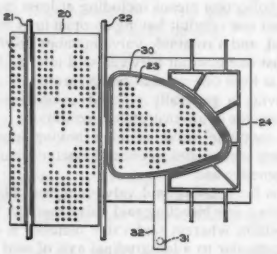
GLASS SHEET ALIGNMENT MEANS AND METHOD OF USING

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 13, 1978, Ser. No. 960,403

Int. Cl.[2] C03B *23/02*

U.S. Cl. 65—106 **34 Claims**



1. In a method of bending glass sheets of the type wherein each glass sheet is heated to a softened condition and then conveyed into a bending station where it is stopped in a sub-

stantially horizontal position and brought into contact with bending means which impart the desired curvature to the glass sheet; the improvement comprising accurately aligning the glass sheet with the bending means by urging the glass sheet in a forward horizontal direction to bring forward portions of the glass sheet having a curved outline into edgewise abutment with at least a portion of an elongated, contoured line of abutment formed by a horizontally extending, rigid frame and conforming to the curved outline of the foward portions of the glass sheet along a sufficient extent of the perimeter of the glass sheet to define a single fixed location and orientation for the glass sheet, and continuing to urge the glass sheet toward said line of abutment after initial contact therebetween by means of a rotating roll contacting a rear edge portion of the glass sheet opposite said forward portions so as to force the forward edge portions of the glass sheet to come into contact with the corresponding portions of said line of abutment and to be guided thereby into the single fixed location and orientation defined by the line of abutment.

8. In an apparatus for horizontally bending glass sheets comprising means for heating glass sheets, a bending station including bending means for engaging a substantially horizontally disposed heat-softened glass sheet and imparting a predetermined curvature thereto, and conveyor means for carrying glass sheets from the heating means into the bending station and supporting the glass sheets in a substantially horizontal position within the bending station; the improvement comprising a horizontally extending, rigidly supported frame over said conveyor means within the bending station, said frame presenting an elongated, curved line of abutment to forward edge portions of a glass sheet entering the bending station, the line of abutment being curved to conform to the outlines of corresponding curved forward edge portions of the glass sheet along a sufficient extent of the perimeter of the glass sheet to define a single fixed location and orientation for the glass sheet, and a driven roll spaced from the line of abutment a distance approximately equal to the length of the glass sheet and mounted at an elevation and orientation so as to contact rear edge portions of the glass sheet opposite said forward edge portions and force the glass sheet into contact with the line of abutment, whereby the glass sheet may be provided with accurate, predetermined alignment within the bending station.

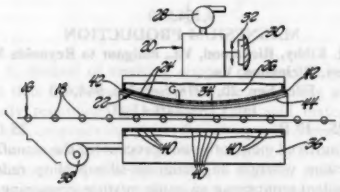
4,204,854
APPARATUS AND METHOD FOR BENDING GLASS SHEETS

Harold A. McMaster, 420 Water St., Woodville, Ohio 43469; John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551, and Dean M. Nitschke, 512 W. Broadway, Maumee, Ohio 43537

Continuation-in-part of Ser. No. 901,533, May 1, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,230

Int. Cl.[2] C03B *23/02*

U.S. Cl. 65—106 **24 Claims**



1. Apparatus for use in bending heated sheets of glass transported generally horizontally on rolls of a roller conveyor within a heating chamber, the apparatus comprising: a glass sheet holder located above the rolls of the roller conveyor in spaced relationship thereto such that a sheet of glass can be transported under the holder by the conveyor; actuable means for supplying pressurized gas, said actuable means including outlet openings located below the rolls of the conveyor so as to blow gas upwardly therebetween against the sheet of glass below the holder after movement thereunder with a sufficient pressure such that the sheet of glass is lifted upwardly into engagement with the holder so as to be spaced above the conveyor; and a curved mold movable under the holder to receive the sheet of glass therefrom.

21. A method for bending heated sheets of glass transported horizontally on a conveyor, the method comprising:

conveying a heated sheet of glass below a holder spaced above the conveyor;

blowing gas upwardly from below the conveyor against the sheet of glass such that the glass is engaged with the holder; and

moving a curved mold under the holder so as to receive the sheet of glass.

4,204,855
APPARATUS FOR DEWATERING GRANULATED-SLAG SLURRY

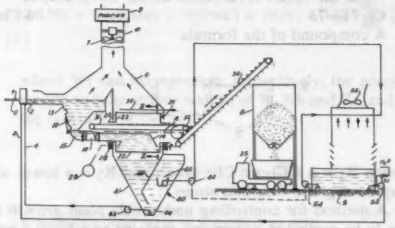
Guido Monteyne, Lembeke, Belgium, assignor to SIDMAR Maritieme Staalnihverheid N.V. Siderurgie Maritime S.A., Ghent, Belgium

Filed Apr. 11, 1979, Ser. No. 29,076

Claims priority, application Luxembourg, Apr. 18, 1978, 79466

Int. Cl.[2] C03B *5/22*

U.S. Cl. 65—141 **12 Claims**



1. An apparatus for treating a granulated-slag/water slurry, said apparatus comprising:

a hollow drum rotatable about an axis and having a foraminous wall and a plurality of vanes extending radially inwardly from said foraminous wall;

feed means including a conduit for feeding a stream of said slurry into said drum and onto the inner surface of said wall thereof at a predetermined relatively low location;

drive means for rotating said drum about said axis and thereby displacing said slurry upwardly from said low location to a relatively high location at such a rate that most of the water in said slurry runs off through said foraminous wall; and

conveyor means having an upstream end below said high location for catching the granulated slag from which the water has run off and for conducting the granulated slag out of said drum.

4,204,856
EDGE STRETCHING APPARATUS INCLUDING INSULATED SEAL

Jeffrey S. Yigdall, Carlisle, Pa., and James A. Zahler, Burkburnett, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

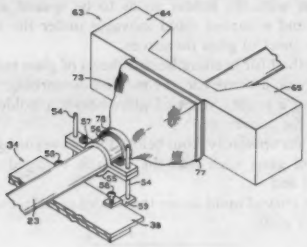
Filed Aug. 14, 1978, Ser. No. 933,238

Int. Cl.[2] C03B *18/02*

U.S. Cl. 65—157 **16 Claims**

1. Apparatus for sealing between edge control machines and forming chamber sidewalls comprising support means, collar means mounted to said support means and slidably surrounding

the barrel of said edge control machine, means mounted between said edge control machine and said collar for maintaining movement of said collar in a vertical plane relative to said



support means in order that it does not bind during movement of said barrel of said edge control machine, and a flexible sleeve fastened to said collar and to said forming chamber sidewall.

4,204,857

5-XANTHOGENATO-3-TRIHALOMETHYL-1,2,4-THIADIAZOLES AND THEIR USE AS HERBICIDES

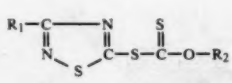
Eugene F. Rothgery, North Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 24, 1979, Ser. No. 6,041

Int. Cl.[2] **A02N** *9/12;* **A01N** *21/02;* **C07D** *285/05*

U.S. Cl. 71—73 **4 Claims**

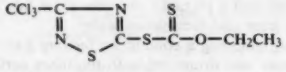
1. A compound of the formula



wherein R_1 is a CCl_3 or CF_3 group and R_2 is a lower alkyl group having 1 to 4 carbon atoms.

3. A method for controlling undesirable plant growth at a locus to be protected comprising applying to a locus a herbicidally effective amount of a compound as claimed in claim **1**.

4. The method of claim **3** wherein said compound is



4,204,858

DIPHENYL ETHER CARBAMATES

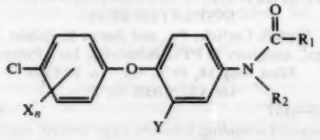
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 695,673, Jun. 14, 1976, abandoned, which is a division of Ser. No. 598,486, Jul. 23, 1975, Pat. No. 3,976,470. This application Oct. 10, 1978, Ser. No. 949,718

Int. Cl.[2] **C07C** *125/04;* **A01N** *9/20*

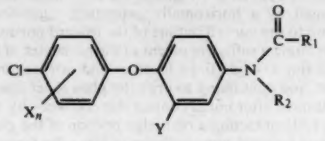
U.S. Cl. 71—111 **33 Claims**

1. A compound having the formula



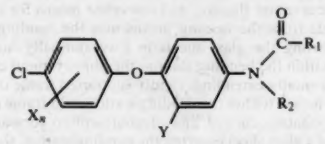
in which **X** is chloro or methyl; n is 1 or 2; Y is chloro or trifluoromethyl; R_1 is lower alkoxy, and R_2 is hydrogen, lower alkoxy-alkyl or lower alkanoyl.

20. An herbicidal composition of matter comprising (a) an herbicidally effective amount of a compound having the formula



in which X is chloro or methyl; n is 1 or 2; Y is chloro or trifluoromethyl; R_1 is lower alkoxy, R_2 is hydrogen, lower alkoxy-alkyl or lower alkanoyl; and (b) an inert carrier.

21. A method of controlling undesirable vegetation comprising applying to the locus thereof an herbicidally effective amount of a compound having the formula



in which X is chloro or methyl; n is 1 or 2; Y is chloro or trifluoromethyl; R_1 is lower alkoxy, R_2 is hydrogen, lower alkoxy-alkyl or lower alkanoyl.

4,204,859

METHOD OF INCREASING THE YIELD OF HYDROCARBONS FROM PLANTS

Henry Yokoyama; Ernest P. Hayman; Wan-Jean Hsu, and Stephen M. Poling, all of Pasadena, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 31, 1978, Ser. No. 891,955

Int. Cl.[2] **A01N** *5/00*

U.S. Cl. 71—121 **4 Claims**

1. A process for increasing the accumulation of rubber hydrocarbons in plants that produce the same, which comprises applying to the plant an effective amount of a compound selected from the group consisting of 2-(3,5-isopropylphenoxy)-triethylamine, 2-(4-t-butylphenoxy)-triethylamine, and 2-(2-napthoxy)-triethylamine.

4,204,860

MAGNESIUM PRODUCTION

Robert M. Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

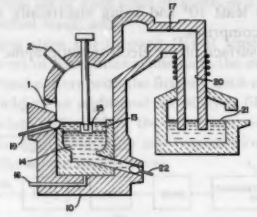
Filed Sep. 20, 1978, Ser. No. 944,493

Int. Cl.[2] **C22B** *45/00*

U.S. Cl. 75—10 R **15 Claims**

1. An improved metallothermic process for the manufacture of magnesium wherein an aluminum-silicon alloy reductant and an oxidant comprising an oxide mixture containing MgO and CaO are charged to the reaction zone of a reduction furnace in the presence of a molten calcium-aluminate slag and magnesium vapor is evolved from the reaction zone and recovered in a condensing means, the improvement which comprises charging less than the stoichiometric amount of magnesium oxide in the oxidant required to consume the aluminum component of the aluminum-silicon alloy reductant to form two liquid layers in the reaction zone, a lower layer comprising calcium-

magnesium-aluminate slag and an upper layer comprising spent aluminum-silicon alloy reductant, and at least periodically



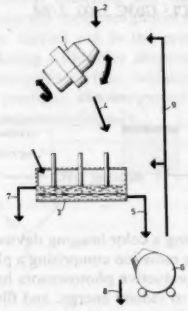
tapping the spent aluminum-silicon alloy from the reaction zone as a by-product.

4,204,861

METHOD OF PRODUCING BLISTER COPPER

Stig A. Petersson, and Bengt S. Eriksson, both of Skelleftehamn, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Division of Ser. No. 774,454, Mar. 4, 1977, Pat. No. 4,144,055. This application Nov. 17, 1978, Ser. No. 961,633
Claims priority, application Sweden, Mar. 12, 1976, 7603238
Int. Cl.² C22B *15/00*
U.S. Cl. 75—73 **4 Claims**



1. A method of smelting copper raw materials containing more than 0.2% antimony to a matte and a slag and simultaneously removing the antimony from said material, which method comprises the steps of smelting said copper raw materials in an inclined rotary furnace rotating at a rotary speed of from about 10 rpm to about 60 rpm together with an addition of iron-containing slag, said iron containing slag being charged to the furnace in quantities such that the total amount of iron present in the furnace is at least 44 times that of the antimony present in the furnace, under supplying heat from a burner, converting the resultant matte smelt in the furnace, subsequent to separating the matte and the slag, by blowing it with an oxygen containing gas through lances to form white metal and a further slag and tapping-off said further slag containing the antimony removed from the matte.

4,204,862

AUSTENITIC HEAT-RESISTANT STEEL WHICH FORMS AL_2O_3 FILM IN HIGH-TEMPERATURE OXIDIZING ATMOSPHERE

Satoshi Kado; Taketomo Yamazaki, both of Fujisawa; Tetsu Sakamoto, Machida; Mikio Yamanaka, Yamato, and Kotaro Yoshida, Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 737,197, Oct. 29, 1976, abandoned. This application Apr. 5, 1978, Ser. No. 893,688
Claims priority, application Japan, Oct. 29, 1975, 50-129312
Int. Cl.² C22C *38/06*
U.S. Cl. 75—124 **8 Claims**

1. An austenitic heat-resistant steel which is capable of forming a film mainly composed of Al_2O_3 when heated in a high-temperature oxidizing atmosphere, said steel consisting essentially of, on a weight basis, not more than 0.2% of C, not more than 1.0% of Si, not more than 2.0% of Mn, 12 to 37% of Ni, 9 to 25% of Cr, more than 4.5 but not more than 6% of Al, not more than 0.8%, in total, of at least one member selected from the group consisting of Ti, Nb and Zr, and a positive amount of at least one rare earth element in a total amount of not more than 0.08%, the balance of said steel being Fe,

said steel being removed of an internal oxide layer which has been formed just below the steel surface during hot working,

said steel having a δ-ferrite value of from zero to 7.9 calculated on the basis of the formula

$$\delta\text{-ferrite value} = 3.0\{(\%Cr) + 1.5(\%Si) + 2.5(\%Al)\} - 2.8[(\%Ni) + 0.5(\%Mn) + 30\{(\%C) + (\%N) - 12\Sigma \frac{Wi}{Mi}\}] - 19.8$$

where Wi and Mi represent, respectively, the percent by weight and the atomic weight of Ti, Nb and Zr, and when the term

$$\{(\%C) + (\%N) - 12\Sigma \frac{Wi}{Mi}\}$$

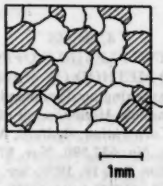
is negative, said term is regarded as zero.

4,204,863

SINTERED CONTACT MATERIAL OF SILVER AND EMBEDDED METAL OXIDES

Horst Schreiner, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,242
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2659012
Int. Cl.² C22C *1/04, 1/10;* B22F *1/00*
U.S. Cl. 75—234 **11 Claims**



1. A sintered contact material of silver and at least two embedded metal oxides made by steps comprising:

(a) preparing a first composite powder of silver and at least one metal oxide;

(b) preparing at least one further composite powder of sil-

ver, and at least one metal oxide using at least one metal oxide different from the metal oxides in the first composite powder;

(c) intimately mixing said first composite powder and said at least one further composite powder together;

(d) pressing the resulting mixture to form a shaped body; and

(e) sintering the shaped body, whereby in the sintered shaped body, at least two of said metal oxides will be distributed in different zones of a mean size between 0.05 and 0.5 mm, and the differrent zones will be uniformly distributed throughout the sintered shaped body.

4,204,864

PARTICULATE SLAGGING COMPOSITION FOR THE CONTINUOUS CASTING OF STEEL

Charles M. Loane, Jr., Bel Air, Md., and Martin L. Hoss, Parma, Ohio, assignors to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 897,717, Apr. 19, 1978, abandoned. This application Feb. 7, 1979, Ser. No. 10,028

Int. Cl.[2] **C22B** *9/10;* **C21C** *7/00*

U.S. Cl. 75—257 **14 Claims**

1. A particulate slagging composition comprising glass network formers and fluxing agents therefor, said compositions characterized by the absence of lithium, and the flowidity and fusion range upon melting suitable for the continuous casting of a steel, the theoretical net oxide analysis values of said composition being within the following ranges:

Oxide	Weight Percent	
K_2O	0.5–6	with the proviso that the weight ratio of K_2O/Na_2O is between 1:2.5 and 1:20 and the Group 1A metal oxides do not exceed 35%
Na_2O	10–30	
CaO	20–41	with the proviso that the Group 2A metal oxides do not exceed 41%
MgO	0–10	
BaO	0–5	
SrO	0–5	
TiO_2	0–4	
ZrO_2	0–3	
Oxide of a Period IV. metal having atomic No. of 23–28, inclusive	0–6	
F (elemental component of the fluorine-providing materials)	0–16	
SiO_2	25–45	with the proviso that these glass network formers do not exceed 45 percent
B_2O_3	0–10	
Al_2O_3	0–8	

wherein the percentages are selected to total 100%.

4,204,865

DIRECT-IMAGING FLEXIBLE OFFSET PRINTING PLATE AND METHOD OF MANUFACTURE

Manfred R. Kuehnle, Lexington; Ferdinand Martinez, Belmont, and Stanley F. Ignasiak, Holliston, all of Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

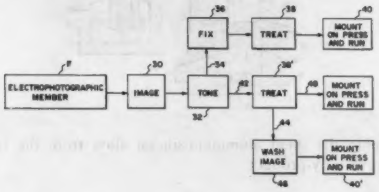
Continuation of Ser. No. 632,590, Nov. 17, 1975, abandoned. This application Jan. 19, 1978, Ser. No. 870,675

Int. Cl.[2] **G03G** *5/04;* **G03F** *7/02*

U.S. Cl. 430—30 **35 Claims**

1. A method of making a direct-imaged flexible printing plate suitable for use in offset or the like lithographic printing from an electrophotographic member of the type which comprises a thin flexible polymer substrate having a thin, transparent ohmic layer deposited thereon and a high gain, sensitive, photoconductive coating is sputtered, wholly inorganic, uniformly vertically oriented crystalline, flexible, transparent, dense and provides an abrasion-resistant surface, the coating having a dark resistivity of at least 10^{12}, a ratio of light to dark resistivity of at least 10^4 and being electrically anisotropic, which method comprises:

charging the surface of the electrophotographic member in darkness,



immediately thereafter exposing the surface to a radiation projected image to form a latent image of charge on said surface,

toning the surface to develop the latent image with a hydrophobic toner and forming a hydrophilic surface coating on the non-imaged areas of the photoconductive coating by treating the toned coating surface with a material directly forming the hydrophilic surface layer on the non-imaged areas.

4,204,866

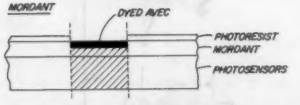
SOLID-STATE COLOR IMAGING DEVICES AND METHOD FOR MAKING THEM

Jerry R. Horak, Rochester; Harold F. Langworthy, Webster; Frederick J. Rauner, and Robert C. Gross, both of Rochester, all of N.Y., assignors to Eastman Kodak Comapny, Rochester, N.Y.

Continuation-in-part of Ser. No. 730,885, Oct. 8, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,841

Int. Cl.[2] **G03C** *5/00, 1/84*

U.S. Cl. 430—306 **6 Claims**



1. A method for making a color imaging device which comprises means for sensing radiation comprising a planar array of charge-handling semiconductive photosensors having sensing areas that are sensitive to radiant energy, and filter means for controlling access of radiation to said sensing means, said filter means being in micro-registration with said array of photosensors and comprising a plurality of radiation intercepting means defining a planar array of filter elements comprising the steps of: superimposing in micro-registration on the array of photosensors said filter means said filter means being formed by a method comprising the steps of:

A. forming a transparent mordant layer on a substrate;

B. coating a layer of photoresist over the mordant layer;

C. exposing the photoresist to a pattern representing a set of filter elements and developing the photoresist to obtain window areas in the photoresist layer corresponding to said pattern;

D. imbibing a dye into the mordant layer through the window areas to fix the dye in the mordant layer by reason of the lateral restraint to dye migration exhibited by the mordant layer so as to produce filter elements each having

an edge sharpness less than about 20 micron, thus forming dyed filter elements corresponding to said pattern;

E. removing the remaining portions of the photoresist to yield a first set of dyed filter elements in a planar array in the mordant layer; and

F. repeating steps (B) through (E) at least once to form another set of dyed filter elements in the mordant layer in an interlaid pattern with the first set, each repetition of the steps yielding an additional set of dyed filter elements in an interlaid pattern with the prior sets, one set having a common light absorption and transmission characteristic that differs from another set.

4,204,867

PROCESS FOR THE PRODUCTION OF COLOR PHOTOGRAPHIC IMAGES USING NEW WHITE COUPLER SUBSTANCES

Karl Küffner, Unterhaching; Wolfgang Lässig; Ernst Meier, both of Munich; Immo Boie, Cologne; Gertrud Kirchhoff, Leverkusen; Helmut Häseler, Leverkusen, and Herbert Stark, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

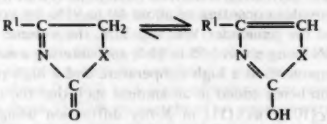
Filed Feb. 10, 1978, Ser. No. 876,701

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705974

Int. Cl.[2] G03C *7/00*

U.S. Cl. 430—376 **2 Claims**

1. A process for the production of colored images by the chromogenic development of an imagewise exposed color photographic material comprising at least one silver halide emulsion layer with which a non-diffusing color coupler is associated, which process includes the processing steps of color development, bleaching and fixing, wherein the improvement comprises the development step and/or the bleaching step is/are carried out in the presence of a compound capable of reacting with color developer oxidation products with the consumption of four oxidation equivalents to form colorless end products, said compound corresponding to formula I or its tautomeric form Ia:



(I) (Ia)

in which

R^1 represents an alkyl group from 1 to 18 carbon atoms, a phenyl group, a naphthyl group, a photographically inert heterocyclic radical selected from the group consisting of pyridyl, thienyl, thiazolyl, furanyl and indole radicals, attached through a ring carbon atom

X represents —S— or —NR^3—

where R^3 represents hydrogen, an alkyl group from 1 to 18 carbon atoms, a phenyl group, a naphthyl group, a photographically inert heterocyclic radical selected from the group consisting of pyridyl, thinyl, thiazolyl, furanyl and indole radicals, attached through a ring carbon atom or an electron-attaching substituent selected from the group consisting of —CN, alkoxy carbonyl, carbamoyl, sulfamoyl, alkyl sulfonyl and aryl sulfonyl radicals.

4,204,868

SALT COMPOUND COMPRISED OF A FERRICYANIDE ANION AND A PROTONATED NITROGEN-SUBSTITUTED HYDROCARBON COMPOUND CATION, AND A STABLE SOLUTION THEREOF

David R. Boston, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 694,480, Jun. 9, 1976, which is a continuation of Ser. No. 531,712, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,364, Jan. 7, 1974, abandoned. This application Nov. 7, 1977, Ser. No. 848,896

Int. Cl.[2] C07F *15/02*

U.S. Cl. 430—461 **4 Claims**

1. A homogeneously stable acidic aqueous salt solution wherein said salt consists of a ferricyanide anion and an organic cation complexing agent capable of forming a water-insoluble, oleophilic complex with oxidized silver, said cation consisting of a protonated nitrogen-substituted hydrocarbon compound containing a formal imine group therein, wherein said hydrocarbon compound is 2-benzyl-2-imidazoline.

2. A salt compound, the anionic portion of which consists of a ferricyanide anion and the cationic portion of which consists of a protonated nitrogen-substituted hydrocarbon compound containing a formal imine group therein, wherein said hydrocarbon compound is 2-benzyl-2-imidazoline.

3. A homogeneously stable acidic aqueous salt solution wherein said salt consists of a ferricyanide anion and a cationic portion consisting of an alkali metal cation and a protonated nitrogen-substituted hydrocarbon compound containing a formal imine group therein, wherein said hydrocarbon compound is 2-benzyl-2-imidazoline.

4. A salt compound, the anionic portion of which consists of a ferricyanide anion and the cationic portion of which consists of an alkali metal cation and a protonated nitrogen-substituted hydrocarbon compound containing a formal imine group therein, wherein said hydrocarbon compound is 2-benzyl-2-imidazoline.

4,204,869

METHOD FOR FORMING NOBLE METAL SILVER PRECIPITATING NUCLEI

Charles H. Byers, Norfolk; Robert W. Hausslein, Lexington, and Mara O. Nestle, Natick, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1978, Ser. No. 897,945

Int. Cl.[2] G03C *1/48;* C03C *17/06, 21/00;* C01G *55/00*

U.S. Cl. 430—564 **18 Claims**

1. A method for forming noble metal silver-precipitating nuclei which comprises the steps of

(a) forming an aqueous solution of a stannous salt;

(b) contacting said solution with an oxidizing agent to partially oxidize said stannous ion to provide a ratio of Sn^{+4} to Sn^{+2} of about 2.5 to 10 to 5.5 to 10; and

(c) adding a noble metal salt or complex.

8. The method of claim 1 which includes the step of coating said nuclei on a support.

4,204,870

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE HETEROCYCLYAZONAPHTHOL DYE-RELEASING COMPOUNDS

Derek D. Chapman, Rochester, and E-ming Wu, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

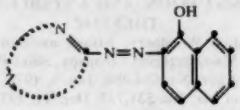
Continuation-in-part of Ser. No. 927,785, Jul. 25, 1978, which is a division of Ser. No. 832,309, Sep. 12, 1977, abandoned. This application Jan. 9, 1979, Ser. No. 2,126

Int. Cl.[2] G03C *1/40;* C09B *45/00*

U.S. Cl. 430—213 **4 Claims**

1. A photographic element comprising a support having

thereon a layer comprising a photographic mordant having bound thereto a coordination complex of a polyvalent metal ion and a compound having the following formula:



wherein:

Z represents the atoms necessary to complete a heterocyclic ring, said heterocyclic ring not being substituted with a nitro group, and said heterocyclic ring being selected from the group consisting of pyridine, pyrimidine, quinoline, isoquinoline, pyrazine, pyridazine, thiazole, thiadiazole, triazole, benzothiazole or acinaphthothiazole.

4,204,871

PRINTING INKS CONTAINING NUCLEATED ORGANIC PIGMENTS

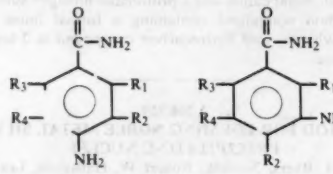
Mark U. Johnson; Jules Rothmayer, and Hugh M. Smith, all of Cincinnati, Ohio, assignors to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 893,454, Apr. 4, 1978, abandoned, which is a division of Ser. No. 805,079, Jun. 9, 1977, abandoned. This application Apr. 4, 1979, Ser. No. 26,586

Int. Cl.[2] C09D *11/02*

U.S. Cl. 106—20 **17 Claims**

1. A printing ink wherein the pigment is a nucleated azo pigment prepared by reacting in aqueous solution (a) a compound having the formula



wherein R_1, R_2, R_3, and R_4 may be the same or different and each may be H, CH_3, or OCH_3, (b) at least one other primary aryl amine, and (c) at least one coupling agent in the presence of (d) a dispersed inorganic material.

4,204,872

PREPARATION OF HIGH TEMPERATURE SHELL MOLDS

Hossein Hayati; Russell S. Towers, both of Adrian, Mich., and Peter G. Carpenter, deceased, late of Westport, Conn., assignors to Stauffer Chemical Company, Adrian, Mich.

Continuation-in-part of Ser. No. 719,776, Sep. 2, 1976, abandoned, which is a continuation of Ser. No. 489,867, Jul. 18, 1974, abandoned. This application Jul. 14, 1977, Ser. No. 815,635

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.35 **2 Claims**

1. A process for preparing a shell mold which comprises coating an expendable pattern with a composition containing a binder which is substantially free of water and a refractory material in which the ratio of refractory material to binder is from about 4 to 50 parts of refractory material per part of binder SiO_2, said binder consisting essentially of a prehydrolyzed alkyl orthosilicate in which the alkyl group has from 1 to 4 carbon atoms, an aminoalcohol of the formula

$$HORN(R')_2$$

in which R is a divalent hydrocarbon radical having from 1 to 6 carbon atoms, R' is selected from the group consisting of hydrogen, an alkyl radical and a radical of the formula —ROH in which R is the same as above, in which the mol ratio of aminoalcohol to alkyl orthosilicate is from 1:1 to 10:1 and sufficient organic solvent to provide an SiO_2 content of from 10 to 35 percent by weight based on the weight of the binder, stuccoing the coated pattern, air drying and repeating the above sequence of steps until a coating of desired thickness is achieved.

4,204,873

SINTERED CERAMIC BODY FOR CUTTING TOOLS

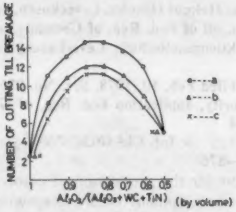
Yoshihiro Yamamoto, Iwakura; Kenji Sakurai, Komaki, and Hiroshi Tanaka, Aichi, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 10, 1979, Ser. No. 37,606

Claims priority, application Japan, Jun. 13, 1978, 53-71240

Int. Cl.[2] B24D *3/04*; C04B *31/16, 35/44, 35/56*

U.S. Cl. 106—43 **9 Claims**



1. A sintered ceramic body for use in cutting tools which has an average crystal grain size of not more than about 2μ and comprises about 60 to 95% by volume of (a) Al_2O_3 and the remainder being composed of (b) WC, provided that it may contain W_2C in which case the intensity ratio $I_{W_2C}(101)/I_{WC}(111)$ in X-ray diffraction using CuKα rays is not more than about 0.5, and (c) TiN, the volume ratio of components (b) to (c) being from about 5:95 to 95:5.

5. A method for producing a sintered ceramic body for use in cutting tools, which comprises adding carbon powder to a starting powder consisting of about 60 to 95% by volume of Al_2O_3 and the remainder WC and TiN, the volume ratio of WC to TiN being about 5:95 to 95:5; and sintering a mixture of these components at a high temperature and a high pressure, said carbon being added in an amount such that the intensity ratio $I_{W_2C}(101)/I_{WC}(111)$ in X-ray diffraction using CuKα rays is not more than about 0.5 and the crystal grain size of the sintered ceramic body does not exceed about 2μ.

4,204,874

LIGHT-TRANSMITTING, POLYCRYSTALLINE ALUMINA BODY AND METHOD FOR PRODUCING THE SAME

Shigetaka Yamada, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Nov. 28, 1978, Ser. No. 964,312

Claims priority, application Japan, Dec. 2, 1977, 52-144730

Int. Cl.[2] C04B *35/10*

U.S. Cl. 106—73.4 **3 Claims**

1. A light-transmitting, polycrystalline alumina body consisting of α-Al_2O_3 containing 0.1 to 1.0 weight percent of strontium oxide.

4,204,875

CEMENTITIOUS COMPOSITIONS

Miklos Szalavitz, Warwick, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jun. 22, 1977, Ser. No. 809,057
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—87 32 Claims

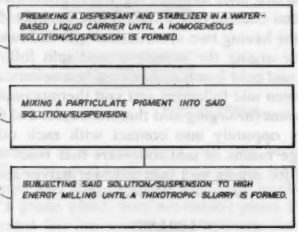
1. A hydraulic cement composition which on mixing with water forms an alkaline aqueous hydraulic cementitious mixture which has the property of setting into a hard mass the volume of which is at least as great as the original volume of the mixture, comprising in admixture a hydraulic cement mix and an agent which generates oxygen gas under the alkaline conditions of the mixture, where said agent is a monopersulfate salt and is present in an amount which will generate sufficient oxygen gas to prevent shrinkage of the mixture during setting and hardening.

4,204,876

CEMENT COLORING COMPOSITION AND METHOD OF PRODUCING SAME

Alan P. Bowden, Binfield, England, assignor to M. Hamburger & Sons, Inc., King of Prussia, Pa.

Filed Jul. 17, 1978, Ser. No. 925,048
Int. Cl.[2] C04B 7/10, 31/28
U.S. Cl. 106—90 29 Claims


A
PREMIXING A DISPERSANT AND STABILIZER IN A WATER-BASED LIQUID CARRIER UNTIL A HOMOGENEOUS SOLUTION/SUSPENSION IS FORMED.
B
MIXING A PARTICULATE PIGMENT INTO SAID SOLUTION/SUSPENSION.
C
SUBJECTING SAID SOLUTION/SUSPENSION TO HIGH ENERGY MILLING UNTIL A THIXOTROPIC SLURRY IS FORMED.

1. Coloring compositions for concrete or mixes or the like comprising:
(a) about 20–70% by weight of a solid particulate pigment,
(b) about 0.4–15% by weight of a stabilizer,
(c) about 0.1–3% by weight of a dispersant, and
(d) about 12–77% by weight of an aqueous carrier which has been mixed and milled to form a thixotropic slurry.

27. A colored concrete or cementitious mixture comprising,
(a) a thixotropic coloring slurry comprising
(1) about 20–70% by weight of a solid particulate pigment,
(2) about 0.4–15% by weight of a stabilizer,
(3) about 0.1–3% by weight of a dispersant, and
(4) about 12–77% by weight of an aqueous carrier,
said slurry having been mixed and subjected to high-energy milling whereupon it is rendered thixatropic and
(b) a wet cement or concrete mix with which said thixotropic slurry has been mixed.

4,204,877

CEMENT GRINDING AID AND SET RETARDER

Howard H. Moorer, Charleston, and Charles M. Anderegg, Sullivan's Island, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,356
Int. Cl.[2] C04B 7/35
U.S. Cl. 106—90 44 Claims

1. A hydraulic cement additive composition comprising a polyglycerol, from 10% to 50% by weight of the total additive composition of a water-soluble glycol, from 10% to 40% by weight of the total additive composition of a water-soluble salt of an aliphatic acid having no more than three carbons, from 10% to 50% by weight of a water-soluble hydroxyalkyl amine based on the combined weight of the glycol and the amine, and from 10% to 30% by weight of the total additive composition of a water-soluble salt of a sulfonated lignin.

4,204,878

RAW MIXTURE FOR THE PRODUCTION OF REFRACTORY HIGH-ALUMINA CEMENT

Boris I. Nudelman; Marsel Y. Bikbau; Pavel A. Oborin, all of Tashkent, and Tamara V. Kuznetsova, Moscow, all of U.S.S.R., assignors to Tashkentsky Nauchnoissledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt", U.S.S.R.

Continuation of Ser. No. 804,265, Jun. 7, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,501
Claims priority, application U.S.S.R., Aug. 20, 1976, 2400198
Int. Cl.[2] C04B 7/32
U.S. Cl. 106—104 9 Claims

1. A raw mixture for the production of a refractory high-alumina cement consisting of a calcareous component, an aluminous component and a chloride of at least one metal, selected from the group consisting of magnesium, calcium, barium, strontium, sodium, potassium, the components being taken in the following proportions, percent by mass;
aluminuous component (calculated for Al_2O_3): 69 to 73
calcareous component (calculated for CaO): 11 to 23
chlorides of said metals: 20 to 4.

4,204,879

AMINO ACID SALTS OF ANIONIC DYESTUFFS WHICH HAVE HIGH SOLUBILITY IN ORGANIC SOLVENTS

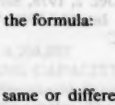
Keith N. Paskins, Twickenham; Duncan C. Redman, Hounslow, and Ian D. Turner, Richmond, all of England, assignors to Williams (Hounslow) Limited, Hounslow, England

Filed Dec. 7, 1977, Ser. No. 858,446
Claims priority, application United Kingdom, Dec. 19, 1976, 51454/76
Int. Cl.[2] C09B 29/38, 45/16, 45/20, 55/00
U.S. Cl. 106—311 18 Claims

1. An amino-acid dyestuff salt of the formula:

$$[Am^+]_{n-q}A^{(-)}{}_{n[Cat^+]_q}$$

wherein Am^+ is an amino-acid cation of the formula:



in which L^1 is a radical of the formula:

$$-(CR^4R^5)_x-$$

where R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, linear and branched alkyl, phenyl, and amino and x is an integer from 1 to 10, R^1, R^2, and R^3 are the same or different and are selected from the group consisting of hydrogen, cycloalkyl of 3 to 7 carbon atoms, phenyl, alkylphenyl, phenylalkyl, alkoxyalkyl, alkylaminoalkyl, alkylamidoalkyl and linear or branched chain alkyl wherein alkyl or alkoxy contains 1 to 20 carbon atoms, and the radical of the formula $—L^2—COOH$ where L^2 is selected from the group $—(CR^4R^5)_x—$ wherein R^4, R^5 and x are as defined above provided that R^1, R^2, and R^3 and x are not each simultaneously L^2

A is an anionic dye selected from the group consisting of azine azo and azomethine dyes and azo and azomethine dyes with transition metals,

Cat^+ is a cationic radical selected from cationic dyestuff radicals and a proton,

n is 1, 2, or 3, q is 0, 1, 2, or 3 provided that n-q is other than

0 and where q is greater than 1 the cations comprising the [cat+] moiety are the same or different.

4,204,880

HIGH SPEED COOLING OF INGOTS

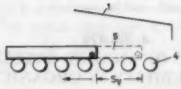
Rudolf Schwitzgöbel, Krefeld, and Karl Monreal, Düsseldorf, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,935

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2704127

Int. Cl.[2] C21D *1/62*

U.S. Cl. 134—32 **5 Claims**



1. In a method of high speed cooling an ingot on a roller track, there being spray nozzles disposed to spray coolant towards the ingot, the improvement of moving the ingot on and by means of the roller track, alternatingly back and forth while being sprayed with the coolant, whereby during phases of motion in one direction, the ingot traverses a path longer than a path it traverses when moved in the opposite direction, so that the ingot engages rolls of the roller track in different positions on each reversal and the ingot progresses stepwise in the one direction.

4,204,881

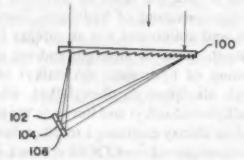
SOLAR POWER SYSTEM

Stephen P. McGrew, 4624 W. 34th St., Spokane, Wash. 99204

Filed Oct. 2, 1978, Ser. No. 947,488

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 PC **11 Claims**



1. An efficient system for converting solar energy into useful energy, comprising:

spectrally dispersive light concentrating means for redirecting said solar energy toward a spectrally dispersed focus, and light energy converting means positioned in the spectrally dispersed focus for converting the redirected solar energy into useful energy, said light energy converting means including at least one element whose spectral response is substantially matched to the spectral range of said redirected solar energy incident thereupon.

4,204,882

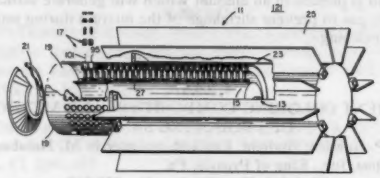
THERMOCOUPLE SPLIT FOLLOWER

Louis J. Howell, deceased, late of Upper Merion Township, Montgomery County, Pa. (by Diane Howell, executrix), assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 3, 1965, Ser. No. 512,824

Int. Cl.[2] H01L *35/04*

U.S. Cl. 136—202 **5 Claims**



1. A radioisotope heated thermoelectric generator assembly, comprising a plurality of thermocouples having first and second ends, said first ends having a hot frame connected thereto and said second ends having a cold frame connected thereto, said cold frame having two symmetrical split follower halves, and means for urging the outside of said split follower into contact with said cold frame, comprising hemispherical mating surfaces between said followers and said thermocouples, resilient spring means for urging said thermocouples and followers longitudinally oppsitely into contact with each other, and tapered wedge means in said followers that react with said spring means for urging said split follower halves apart.

4,204,883

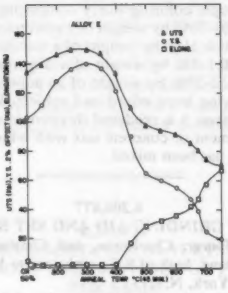
TARNISH RESISTANT COPPER ALLOY

Richard D. Smith, Acton, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 769,723, Feb. 17, 1977, Pat. No. 4,113,475, which is a continuation-in-part of Ser. No. 675,604, Apr. 9, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 938,714

Int. Cl.[2] C22C *9/01*; C22F *1/08*

U.S. Cl. 148—2 **9 Claims**



1. A process for making a tarnish resistant copper alloy having a film resistance of at least 95 kilohms, said process comprising the steps of:

A. forming a hot liquid solution of metals consisting essentially of the following constituents in the following amounts in percent by weight:

Al 7–8.5

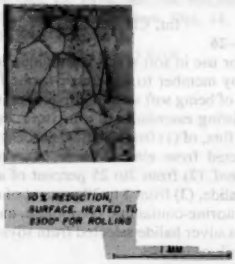
Ni 1.5–2.5
Cu 89–91.5
B. cooling the metal solution to form a solid; and
C. subjecting the solid to a heat treatment to produce a metallic structure comprising an alpha phase matrix made of aluminum in solid solution with copper and containing dispersed NiAl, said structure containing less than 2 volume percent beta and gamma phases.

4,204,884

METHOD OF CONDITIONING CAST STEEL FOR HOT WORKING

Erik E. Berg, Stockholm, and Rolf Tingwall, Avesta, both of Sweden, assignors to Ingersoll Steel Company, New Castle, Ind.

Continuation of Ser. No. 932,713, Aug. 11, 1978, abandoned. This application Mar. 15, 1979, Ser. No. 21,270
Int. Cl.² C21D 7/02
U.S. Cl. 148—2 **9 Claims**



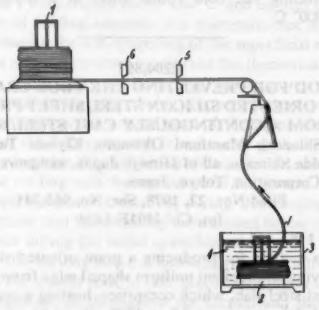
1. A method of conditioning a cast steel body to undergo recrystallization upon heating to reduce the tendency for surface defects and edge-cracking upon hot working, the steel being of a grade which does not exhibit phase transformation when heated for hot working, comprising the step of cold rolling the body to an extent such that the cross-section quotient product after cold rolling is from about 0.99 to about 0.75; such step being performed on the body as the first step in converting it to an intermediate slab, plate, band or billet without prior treatment other than initial removal of scale and surface defects.

4,204,885

METHOD FOR PROVIDING STRONG WIRE

Jaak S. Van den Sype, Scarsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 21, 1979, Ser. No. 22,631
Int. Cl.² C21D 1/62, 9/52
U.S. Cl. 148—12 B **5 Claims**



1. In a process for improving the strength characteristics of a wire composed of an austenitic metal alloy selected from the group consisting of stainless steel alloys of the AISI 200 and 300 series and non-stainless steel alloys containing iron, manganese, chromium, and carbon, said alloy having an Md temperature of no higher than about 100° C. and an Ms temperature of no higher than about minus 100° C., comprising the following steps:

(a) deforming the wire at a strain of at least about 10 percent and at a temperature in the range of about Md minus 50° C. to about Md plus 50° C., said Md temperature being that of the alloy undergoing deformation, in such a manner that the wire has a martensite phase of no greater than about 10 percent by volume and an austenite phase of at least about 90 percent by volume and a yield strength in the range of about 130,000 psi to about 230,000 psi;

(b) cooling the wire to a temperature no higher than about minus 75° C.; and

(c) drawing the cooled wire thereby by the cross-sectional area of the wire is reduced by a certain percentage and the wire has a martensite phase of at least about 50 percent by volume and an austenite phase of at least about 10 percent by volume,

the improvement comprising carrying out the drawing of step (c) by drawing the wire through two dies placed in series in such a manner that the cross-sectional area of the wire is reduced by the first die by a percentage in the range of about 8 to about 15 percent and the cross-sectional area of the reduced wire is further reduced by the second die by a percentage in the range of about 8 to about 15 percent based on the area of the wire exiting the first die.

4,204,886

METHOD FOR IMPROVING AND ARTICLE HAVING IMPROVED WEAR RESISTANCE

Frederick P. Bens, Grosse Point City, Mich., assignor to Kolene Corp., Detroit, Mich.

Filed Apr. 24, 1979, Ser. No. 32,736
Int. Cl.² C23C 9/16
U.S. Cl. 148—15.5 **4 Claims**

1. A method of improving the resistance of ferrous metal parts to galling and seizure in friction environments which process comprises,

first providing a nitride case on said metal part,

thereafter applying a coating of molybdenum-disulfide over said nitride case.

4. A ferrous metal part having increased resistance to galling and seizure in friction application comprising, a nitride case on said part, and a coating of molybdenum-disulfide over said nitride case.

4,204,887

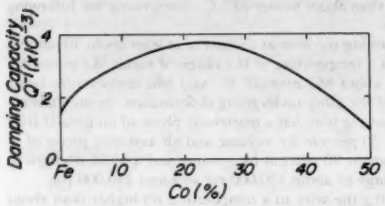
HIGH DAMPING CAPACITY ALLOY

Hakaru Masumoto, and Showhachi Sawaya, both of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric & Magnetic Alloys, Sendai, Japan

Continuation of Ser. No. 672,313, Mar. 31, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,847
Claims priority, application Japan, Apr. 4, 1975, 50-41083
Int. Cl.² H01F 1/00
U.S. Cl. 148—31 **9 Claims**

2. A process for producing a high damping capacity alloy comprising the steps of melting a starting material consisting essentially of 1–20 weight % of cobalt and remainder iron as a main component and further including a 0.01–30 weight % in total of an additional subcomponent consisting of at least one element selected from the group consisting of less than 20 weight % of chromium, aluminum and copper, less than 10 weight % of manganese, antimony, niobium, molybdenum, tungsten, titanium, vanadium and tantalum, less than 5 weight % of silicon, tin, zinc, zirconium, and less than 1 weight % of yttrium in a furnace, adding to the melt a small amount less

than 1% of an element selected from a group consisting of manganese, silicon, titanium, aluminum and calcium so as to remove undesirable impurities, shaping the product into a desired form, heating the thus formed article at a high temperature between its melting point and above 800° C. for more than one minute to 100 hours, and cooling the article at a suitable cooling rate to room temperature to produce an alloy having a damping capacity more than 2×10^{-3} against vibration.



4,204,888

HIGH DAMING CAPACITY ALLOY

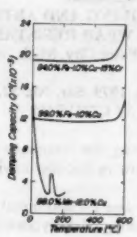
Hakaru Masumoto, and Showhachi Sawaya, both of Sendai, Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

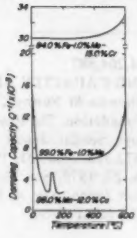
Division of Ser. No. 685,986, Mar. 13, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,695

Claims priority, application Japan, May 19, 1975, 50-58735; May 29, 1975, 50-63424

Int. Cl.[2] C22C *39/14, 39/20*

U.S. Cl. 148—31 **4 Claims**





1. A high damping capacity alloy consisting essentially of from 0.01 to 5% of either copper, molybdenum or mixtures of the two, with the balance being essentially iron, and at least one additional ingredient or ingredients in an amount of from 0.01 to 40 weight percent, which ingredients fall in at least one of the following groups (A) through (D):

(A) up to 40% chromium

(B) up to 10% aluminum, antimony, niobium, tungsten, titanium, vanadium or tantalum

(C) up to 5% silicon, tin, zinc or zirconium

(D) up to 1% cobalt, lead or yttrium,

said alloy having been formed into an article at a temperature lower than 1,300° C. and thus formed article being subjected to a heat treatment according to the following schedule:

(a) heated to a temperature of not less than 500° C. but below its melting point for one minute to 100 hours to effect solution treatment, followed by

(b) cooling at a rate of between 1° C./sec and 1° C./hour,

said treatment being effective to achieve a damping capacity of more than 2×10^{-3} against vibration.

4,204,889

SOFT SOLDERING OF ALUMINIUM

Bernard M. Allen; Wallace Rubin, and Brian Watson, all of Hemel Hempstead, England, assignors to Multicore Solders Limited, Hemel Hempstead, England

Filed Sep. 13, 1978, Ser. No. 941,768

Claims priority, application United Kingdom, Oct. 18, 1977, 43375/77

Int. Cl.[2] B23K *35/34*

U.S. Cl. 148—26 **10 Claims**

1. A flux for use in soft soldering an aluminium or aluminium-based alloy member to a member formed from a metal or alloy capable of being soft soldered to aluminium at a joint site, the flux consisting essentially of a mixture, based on the total weight of the flux, of (1) from 60 to 90 percent of a heavy metal chloride selected from zinc chloride, stannous chloride and mixtures thereof, (2) from 2to 25 percent of an ammonium or alkali metal halide, (3) from 1 to 20 percent of an ammonium or alkali metal fluorine-containing compound, and (4) from 0.5 to 20 percent of a silver halide selected from silver chloride, silver bromide and silver iodide.

4,204,890

METHOD OF PRODUCING NON-ORIENTED SILICON STEEL SHEETS HAVING AN EXCELLENT ELECTROMAGNETIC PROPERTY

Toshio Irie, Chiba; Ko Matsumura, Ichihara; Hiroto Nakamura, Chiba; Hiroshi Shimanaka, Funabashi, and Toshio Suzuki, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Nov. 8, 1978, Ser. No. 958,607

Claims priority, application Japan, Nov. 11, 1977, 52/134688

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—111 **7 Claims**

1. A method of producing non-oriented silicon steel sheets having excellent electromagnetic properties, comprising annealing a hot rolled sheet consisting of not more than 0.02% of C, 0.5–3.5% of Si, 0.1–1.0% of Al, 0.1–1.0% of Mn, not more than 0.007% of S, 0.005–0.30% of Sb and the remainder being substantially Fe at a temperature of 700°–950° C. for 2 minutes to 20 hours, cold rolling the annealed sheet into a final gauge, and annealing the cold rolled sheet at a temperature of 750°–1,000° C.

4,204,891

METHOD FOR PREVENTING THE EDGE CRACK IN A GRAIN ORIENTED SILICON STEEL SHEET PRODUCED FROM A CONTINUOUSLY CAST STEEL SLAB

Morio Shiozaki; Masafumi Okamoto; Kiyoshi Tanaka, and Takahide Shimazu, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 965,241

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—111 **3 Claims**

1. In a method for producing a grain oriented silicon steel sheet having an excellent uniform shaped edge from a continuously cast steel slab, which comprises: heating a continuously cast steel slab containing 2.5 to 4.0% silicon to a temperature between 1280° C. and 1430° C., hot rolling the heated slab at a starting temperature not lower than 1050° C. in a finish hot

rolling step, continuously annealing the hot rolled sheet, cold rolling the annealed sheet and finally annealing the cold rolled sheet at a high temperature for secondary recrystallization, the improvement which comprises subjecting the slab to a series of rough hot rolling passes prior to the hot finishing step such that the reduction rate in the last half stage of the rough hot rolling is 5 to 35% so as to prevent edge cracks in a hot coil thus-produced from the method; said rough rolling being performed at a temperature not less than 1050° C.

4,204,892

HEAT-TREATING TUBULAR STEEL SECTIONS

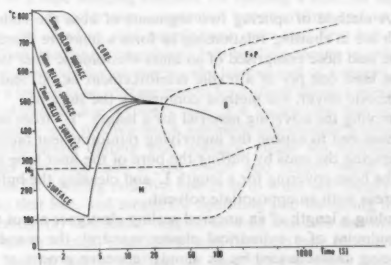
Marios Economopoulos, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Oct. 13, 1978, Ser. No. 950,985

Claims priority, application Belgium, Oct. 14, 1977, 859780; Apr. 25, 1978, 866366

Int. Cl.[2] C21D *9/08*

U.S. Cl. 148—145 **14 Claims**



1. A process for treating a tubular steel section by the sequential steps of providing the section at a temperature greater than a temperature between Ac_3 and Ac_1, corresponding to at most 15% ferrite in the steel, comprising:

(a) subjecting the section to quenching producing martensite, by intense cooling by means of a cooling agent to a temperature below M_s, and subjecting the section to still air cooling, in which the conditions of intense cooling are such that the effects of quenching are limited to at least one surface layer of the section and that, at the end of the quenching step, that part of the section remote from the quenched surface layer is at a temperature above 675° C. which permits self-tempering of the quenched surface layer at a temperature above 450° C. and ensures transformation of residual austenite to a martensite-free structure;

(b) terminating the self-tempering of the superficial martensite at a skin temperature lower than the theoretical equalisation temperature or tempering temperature, the said theoretical temperature being the temperature to which the surface and the central part of the tube would converge if the following step (c) were not applied;

(c) following step (b), subjecting the section to sudden and intense cooling such that the points of the section reaching a temperature lower than M_s during this cooling are at most those that have already been cooled below this temperature during the initial quenching step; and

(d) after this cooling step (c), allowing renewed self-tempering of the cooled zone to take place, resulting in temperature equalisation throughout the section and then in the transformation of the residual austenite starting from the equalisation temperature thus reached.

4,204,893

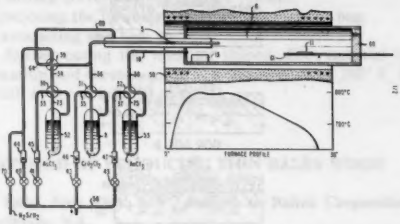
PROCESS FOR DEPOSITING CHROME DOPED EPITAXIAL LAYERS OF GALLIUM ARSENIDE UTILIZING A PRELIMINARY FORMED CHEMICAL VAPOR-DEPOSITED CHROMIUM OXIDE DOPANT SOURCE

Herbert M. Cox, Hackettstown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 16, 1979, Ser. No. 12,713

Int. Cl.[2] H01L *21/205, 21/84*

U.S. Cl. 148—175 **7 Claims**



1. A process for depositing a chrome doped epitaxial layer of GaAs on a substrate comprising the steps of combining a gas phase composition which contains a GaAs precursor with a chromium containing dopant to form a deposition composition and forming said epitaxial layer by contacting said substrate with said deposition composition under conditions which result in epitaxial growth of GaAs on said substrate characterized in that a dopant source is obtained by the chemical vapor deposition of a chromium oxide and said chromium containing dopant is then formed by passing a reactive gas which forms volatile chromium containing compounds with chromium oxide over said dopant source wherein said reactive gas is substantially absent over said dopant source during said chemical vapor deposition of said dopant source.

4,204,894

PROCESS FOR FABRICATION OF SEMICONDUCTORS UTILIZING SELECTIVELY ETCHABLE DIFFUSION SOURCES IN COMBINATION WITH MELT-FLOW TECHNIQUES

Tadao Komeda, Yamatotakada, and Kazufumi Ogawa, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 2, 1979, Ser. No. 35,236

Claims priority, application Japan, Nov. 5, 1978, 53/56303

Int. Cl.[2] H01L *21/225, 21/316*

U.S. Cl. 148—188 **17 Claims**

1. A process for fabricating semiconductor devices characterized by the steps of

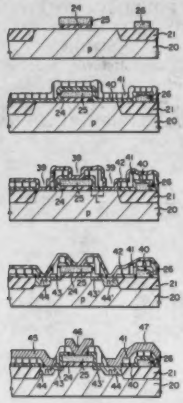
forming a first insulating layer containing n- or p-type impurities over the surface of a p- or n-type semiconductor wafer,

forming a second insulating layer over said first insulating layer, said second insulating layer being softened or meltable at low temperatures, selectively removing portions of said first and second insulating layers so as to selectively expose said semi-conductor wafer,

forming a third insulating layer containing n- or p-type impurities over the surface of said semiconductor wafer including its exposed areas, said third layer being selectively etchable from said second layer,

heating said wafer so as to fluidize or soften or melt said

second insulating layer while diffusing said n- or p-type impurities from said first and third insulating layers into



said semiconductor wafer, and removing said third insulating layer by selective etching.

4,204,895

GREEN FLARE COMPOSITIONS

Henry A. Webster, III, Ellettsville, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1978, Ser. No. 934,659

Int. Cl.[2] C06G *45/10*

U.S. Cl. 149—19.6 **2 Claims**

1. A green flare composition free of chlorine containing compounds consisting essentially, by weight of between 25 and 40 percent of magnesium, between 5 and 15 percent of boron, between 40 and 55 percent of barium nitrate, and about 5 percent of an epoxy binder.

4,204,896

PRODUCTION OF CABLE JOINTS

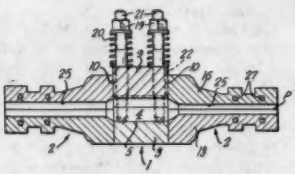
John Richardson, Luton, England, assignor to Hayward Tyler Limited, Bedfordshire, England

Filed Sep. 5, 1978, Ser. No. 939,733

Claims priority, application United Kingdom, Sep. 9, 1977, 37634/77

Int. Cl.[2] B21F *15/02*; B29C *6/02*

U.S. Cl. 156—49 **9 Claims**



1. A method for producing a joint, between a plurality of cables, insulated by cross-linked polyethylene material, comprising connecting electrically conductive parts of said cables together, covering the electrical joint thus produced and adjacent portions of the cables with cross-linked polyethylene material in uncured condition, placing the said covered electrical joint and adjacent cable portions in a mould, closing the mould with the said joint and cable portions enclosed with a tight fit therein, heating the enclosed joint within the mould until the said polyethylene material is cured throughout its thickness, cooling the joint in the mould, and, during the cooling of the joint, producing compression over at least substantially the whole of the joint by applying pressure mechanically to at least one relatively movable wall part of the mould in contact with the said material, whereby the formation and persistence of voids in the cured joint is substantially suppressed.

4,204,897

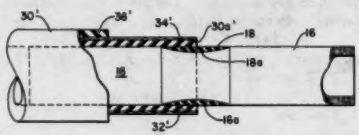
METHOD AND APPARATUS FOR SPLICING HOSE

Jeffrey M. Bartell, Rome, N.Y., and Robert V. D'Elia, Canton, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 25, 1978, Ser. No. 927,717

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—155 **5 Claims**



1. A method of splicing two segments of hose the ends of which are in abutting relationship to form a juncture therebetween, said hose comprised of an inner elastomeric liner tube, and at least one ply of a textile reinforcement fabric, and an elastomeric cover, the method comprising the steps of:

removing the covering material for a length "L" from each hose end to expose the underlying reinforcement fabric;

preparing the ends by buffing the bore of the liner tube and the hose covering for a length L' and cleaning the buffed areas with an appropriate solvent;

winding a length of an uncured sealing elastomer about the midpoint of a cylindrical plaster mandrel, the mandrel being characterized by an annular concave groove at its midpoint, the sealing elastomer filling the groove to the outer surface of the mandrel, the circumference of the outer surface of the mandrel being substantially equal to the bore circumference of the hose being spliced when positioned on the mandrel;

inserting the mandrel into each hose end bore such that the ends are in an abutting relationship at the approximate midpoint of the mandrel in the area of the sealing elastomer;

filling the juncture of the abutted ends with an uncured elastomeric packing for the depth of the hose liner tube and the reinforcement fabric to fill any gaps that may exist therebetween due to a mismatch of the ends;

wrapping the juncture of the abutted ends with a reinforcement textile fabric material having uncured elastomeric gum on both surfaces to provide a bond with the underlying hose reinforcement for the length 2L of the exposed hose reinforcement;

wrapping an uncured elastomer cover about and completely covering the reinforcement textile fabric for the length 2L and extending an additional length in either longitudinal direction to overwrap the existing hose cover for the length L' such that the overall covering has a width at least 2L+2L';

wrapping a cure tape about the splice area such that the multiple thicknesses of the tape result across the width of the splice;

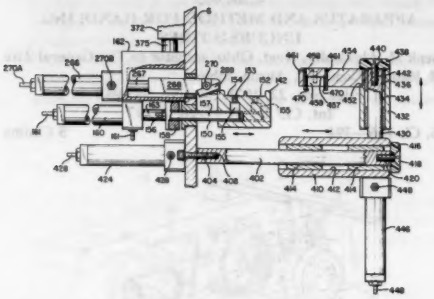
heating the splice area to vulcanize the underlying splice components; and

removing cure tape upon completion of the vulcanization and breaking up the plaster mandrel within the hose so that it may be washed out under normal fluid pressure.

4,204,898
TAPE WINDING AND SPLICING MACHINE

James L. King, Southboro, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Jun. 21, 1978, Ser. No. 917,638
Int. Cl.[2] B65H 19/20
U.S. Cl. 156—159 9 Claims



1. In a tape winding machine for splicing a selected supply tape into a leader tape connected between first and second hubs and winding said supply tape onto said first hub, said winding machine comprising: hub-holding means, a splicing block assembly for supporting the leading end of a supply tape and a leader tape, cutting means for cutting along a predetermined cutting line a supply tape or a leader tape that is supported by said splicing block assembly and extends across said predetermined cutting line, splicing means for splicing together abutting ends of the leader and supply tapes, drive means for rotating said first hub so as to wind said supply tape on to that hub, and means for operating said foregoing means whereby: (a) said leader may be severed into two sections, (b) the leader section attached to said first hub may be spliced to the leading end of said supply tape, (c) a selected length of supply tape and the one leader section may be wound onto said first hub, (d) the supply tape may be severed so as to form a trailing end for said length of supply tape on said splicing block assembly, and (e) the leader section may be spliced to the trailing end of the severed length of supply tape;

a splice trimmer assembly for removing substantially all tape overhang from a splice, said splice trimmer assembly comprising:

(1) cutting means for trimming the splice of a spliced tape on said splicing block so as to eliminate any tape overhang from the edges of said spliced tape at said splice; and

(2) transport means for supporting said cutting means and for moving said cutting means into and out of engagement with opposite edges of a spliced tape on said splicing block, said transport means comprising a first means for mounting and moving said cutting means vertically relative to said splicing block and a second means for mounting and moving said first means horizontally relative to said splicing block.

4,204,899
CORK-RESIN ABLATIVE INSULATION FOR COMPLEX SURFACES AND METHOD FOR APPLYING THE SAME

Hill M. Walker, Guntersville; Max H. Sharpe, and William G. Simpson, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 12, 1978, Ser. No. 941,711
Int. Cl.[2] B29C 17/00, 17/04
U.S. Cl. 156—212 3 Claims

1. The method of preparing cork-resin ablative insulation material for application to a complex curved substrate comprising:

(a) mixing finely divided cork with a B-stage curable thermosetting resin, said resin comprising 20 to 60 weight percent of the mixture;

(b) forming the resulting mixture into a block;

(c) B-stage curing the resin-containing block by heating at a temperature of 280° F. to 320° F. for a period of at least about 15 minutes;

(d) cutting the B-stage cured block into sheets;

(e) draping the resultant sheet material over said substrate or a surface corresponding in shape thereto;

(f) enclosing the resulting assembly in a vacuum bag;

(g) evacuating said bag; and

(h) further curing the resultant shaped sheet material by heating said sheet material at a temperature of 280° F. to 320° F. for at least 30 minutes.

4,204,900
METHOD OF PRODUCING THIN BALSA WOOD SHEETS

Jean Kohn, New York, N.Y., assignor to Baltek Corporation, Northvale, N.J.

Filed Feb. 13, 1979, Ser. No. 11,936
Int. Cl.[2] B32B 31/00; B27D 1/00, 9/00
U.S. Cl. 156—255 7 Claims

1. A technique for converting logs cut from balsa wood trees into two-ply sheets which are substantially immune to changes in relative humidity and ambient temperature, the technique comprising the steps of:

A stripping the bark from the logs;

B cutting the debarked logs into bolts of a predetermined length, each bolt being cut in a veneer lathe to produce a continuous web of veneer;

C slicing each web into green sheets of veneer;

D kiln-drying the green veneer sheets to produce dried sheets having a curvature due to the cutting and drying operations;

E assembling the curved dried sheets having opposing curvatures into matched pairs whose curvatures are in face-to-face relationship, the sheets in each pair being derived from a common web whereby they share like wood characteristics; and

F laminating the sheets in each pair together to produce two-ply flat sheets suitable for model making and for forming light-weight multi-ply plywood, the two-ply flat sheets having a planarity which is substantially immune to atmospheric changes.

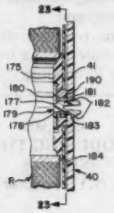
4,204,901
HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 790,519, Apr. 25, 1977, Pat. No. 4,116,747.
This application Feb. 7, 1978, Ser. No. 875,827
Int. Cl.[2] B32B 31/00
U.S. Cl. 156—384 5 Claims

1. Hand-held apparatus for applying labels, comprising: a frame having a handle, means carried by the frame for mounting a label roll comprised of labels releasably secured by pres-

sure sensitive adhesive to a web of supporting material, an actuator disposed at the handle, a platen mounted by the frame, a print head cooperable with the platen, means for delaminating printed labels from the supporting material web, means disposed adjacent the delaminating means for applying printed labels, means for advancing the web about the delaminating means, and means responsive to movement of the actuator for moving the print head into printing cooperation with the platen and for moving the web advancing means, wherein the label roll mounting means includes a pair of spaced apart hub members mounted for rotation about a common axis and pro-



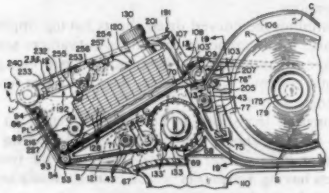
jecting into opposite ends of a central hole in the label roll, a disc adjacent at least one of the hub members, the disc having a continuous outer periphery, a first generally central hole and a second hole opening into the first hole and being larger in size than the exterior of the related hub member, the disc having a greater radial extent than the related hub member, and means received in the first hole for mounting the disc, a gap at the opening between the first and second holes being less than the outside dimension of the mounting means, the disc being capable of being installed by passing the hub member through the second hole and thereupon shifting the disc so that the disc is snapped onto the mounting means.

4,204,902

HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 790,519, Apr. 25, 1977, Pat. No. 4,116,747.
This application Feb. 7, 1978, Ser. No. 875,840
The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—384 **4 Claims**



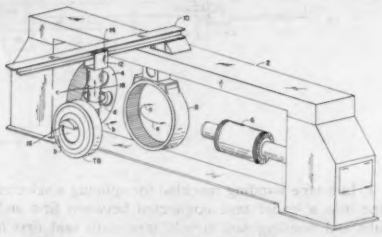
1. Hand-held apparatus for printing and applying pressure sensitive labels releasably adhered to a web of supporting material, the web being wound into a roll comprising: a frame having a handle, a platen and a cooperable print head mounted by the frame, the print head being movable from an initial position to a printing position in cooperation with the platen, means disposed adjacent the platen for delaminating labels from the web, means for advancing the web, an actuator disposed at the handle, means responsive to movement of the actuator for moving the print head into printing cooperation with the platen and for moving the web advancing means, a brake including a roller mounted by the frame downstream of the place where the web is paid out of the label roll and upstream of the platen for applying a braking force to the web, the brake further including a plurality of leaf springs carried by the print head and in contact with the brake roller at spaced apart locations when the print head is in or near the initial position.

4,204,903

APPARATUS AND METHOD FOR HANDLING UNCURED TIRES

Joseph H. Alexander, Kent, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Sep. 22, 1978, Ser. No. 945,045
Int. Cl.[2] B29H *17/20, 17/37*
U.S. Cl. 156—394 **5 Claims**



1. In an apparatus for removing an uncured tire band from a tire building drum having horizontal axis of rotation, said apparatus including rail means extending parallel to said axis of said drum, a carriage mounted on said rail means and movable along said rail means in a direction parallel to said tire building drum axis, and a transfer ring mounted on said carriage for holding said uncured tire band, the improvement comprising:

(a) journal and bearing means having a vertical axis connecting said transfer ring to said carriage, said transfer ring being rotatable relative to said carriage about said vertical axis of said journal and bearing means;

(b) a first lug surface on said transfer ring and a second lug surface on said carriage, said first and second lug surfaces positioned to engage each other to stop the rotation of said transfer ring in a first direction when said transfer ring is axially aligned with said tire building drum;

(c) a third lug surface on said transfer ring and a fourth lug surface on said carriage, said third and fourth lug surfaces positioned to engage each other to stop the rotation of said transfer ring in the direction opposite from said first direction when the axis of said transfer ring is disposed at the desired angle to the axis of said building drum for transferring an uncured tire band held by said transfer ring to a suitable transport means;

(d) first releasable means for holding said first lug surface in engagement with said second lug surface to hold said transfer ring in axial alignment with said tire building drum; and

(e) second releasable means for holding said third lug surface in engagement with said fourth lug surface to hold said transfer ring with its axis disposed at said desired angle to said axis of said building drum.

4,204,904

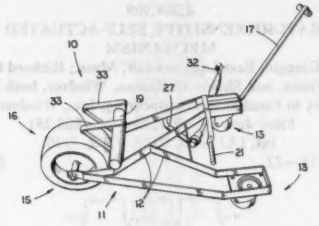
ROOFING MATERIAL HANDLING AND SEALING MACHINE

Donald R. Tabor, P.O. Box 1606, Anderson, Ind. 46014

Filed Oct. 17, 1977, Ser. No. 842,939
Int. Cl.[2] B32B *31/00;* **B44C** *7/00*
U.S. Cl. 156—497 **7 Claims**

1. A roofing material handling and sealing machine for installing partially-overlapping heat-sealable roll roofing material and the like, comprising:

(a) A frame having a front portion and a rear portion thereof;
(b) means for moving said frame along the joint formed by the overlapping edge portions of two laid sheets of the material;
(c) means for lifting only the upper overlapping edge portion of the material while said frame is moved therealong;
(d) means for heating both contact surfaces on the overlapping edge portions of the material while the upper portion is lifted and said frame is moved therealong, said means for heating being to an extent sufficient to allow the contact surfaces to the sealably joined; and
(e) means for pressing the heated contact surfaces together with sufficient force to sealably join the overlapping edge portions of the material, said frame including two spaced-



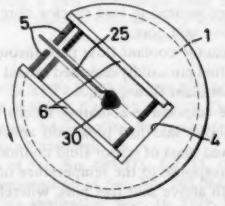
apart front wheel assemblies and a rear wheel assembly mounted thereto, said means for moving and for pressing including means for straddling the overlapping edge portions of the material with the two front wheel assemblies while the rear wheel assembly presses against the overlapping joint formed thereby, said means for lifting including a lifting foot mounted to said frame and positioned on the underside thereof, said lifting foot being forward of said means for heating,
said means for heating including a heating element mounted to said frame and positioned back of said lifting foot,
said lifting foot including a rotating elongated portion that rotatably contacts the upper overlapping edge portion of the material while said frame is moved therealong.

4,204,905

TAPING MACHINE

Saburo Miyamoto, Ibaraki, Japan, assignor to Nitto Denki Kogyo Kabushiki Kaisha (Nitto Electric Industrial Co., Ltd.), Osaka, Japan

Filed Aug. 4, 1978, Ser. No. 931,281
Claims priority, application Japan, Aug. 19, 1977, 52/111327[U]
Int. Cl.[2] B31F *1/00*
U.S. Cl. 156—351 **3 Claims**



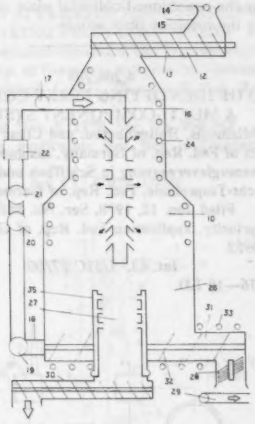
1. A taping machine for winding an adhesive tape around an object such as a cable, said machine comprising:
(a) a rotor mounted in said machine for rotation having a radial opening extending from its outer periphery beyond its axis;
(b) a drive means connected to said rotor for rotating said rotor a predetermined number of turns per cycle of operation;
(c) a tape feed means for feeding the adhesive tape into position over said rotor;
(d) a tape cutting means adjacent the path of feed of the tape for cutting the tape to a predetermined length;
(e) a brush on each of the opposite walls of said radial opening for winding the tape around the object by frictional action as the rotor turns with the object held in the opening;
(f) a first detector means located near the mouth of said radial opening and connected to said tape cutting means, for actuating said tape cutting means as the object is inserted into said radial opening; and
(g) a second detector means located further from the mouth of said radial opening than said first detector means and connected to said drive means and said tape feed means, for actuating said drive means and said tape feed means as the object is inserted into said radial opening.

4,204,906

METHOD OF SEPARATING FUSIBLE PLASTICS FROM SOLID WASTE

Hsin Liu, 40-25 Hampton St., Elmhurst, N.Y. 11373

Filed Aug. 25, 1977, Ser. No. 827,693
Int. Cl.[2] D21C *5/02*; B03B *1/00*; C10B *57/04*
U.S. Cl. 162—6 **6 Claims**



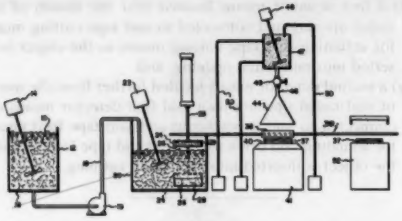
1. A method for treating a solid waste containing fibrous combustible matters and fusible plastics in a single waste-treating vertical and elongated, heating zone, comprising the steps of:
providing in said zone a gaseous atmosphere which will not support combustion at the temperature in said zone,
said temperature being higher than the combustion initiating temperature of said fibrous combustible matters in air;
feeding said solid waste to a top portion of said elongated heating zone;
dropping said solid waste into said heating zone, said solid waste falling under gravity inside said zone;
during the gravitational drop heating said waste to a temperature sufficiently high to fuse said fusible plastics without initiating combustion; and
simultaneously establishing within said zone a gas flow that has a substantial, horizontal component to separate said falling and fusing plastics from said falling fibrous combustible matters.

4,204,907

CONDITIONED COLLOIDAL SILICA POST IMPREGNANT TO PREVENT BINDER MIGRATION

Harris J. Korklan, Granger, and John K. Greany, South Bend, both of Ind., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 29, 1978, Ser. No. 891,368
Int. Cl.[2] D21F 13/00
U.S. Cl. 162—135 10 Claims



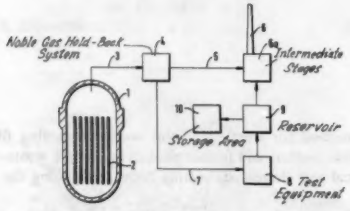
1. A process for forming a refractory fiber article comprising placing a refractory fiber slurry into a mold and draining liquid therefrom; impregnating the resulting fiber article with a conditioned colloidal silica composition comprising colloidal silica, acid and a multivalent cation containing gelling compound; applying a differential pressure through said article, waiting for the conditioned colloidal silica composition to gel and drying the resulting fiber article.

4,204,908

METHOD OF IDENTIFYING LEAKY COMPONENTS OF A MULTI-COMPONENT SYSTEM

Walfried Michaelis, Bullenhausen, and Claus Weitkamp, Wentorf, both of Fed. Rep. of Germany, assignors to Gesellschaft für Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthacht-Tesperhude, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,796
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1977, 2700952
Int. Cl.[2] G21C 17/00
U.S. Cl. 176—19 LD 1 Claim



1. A method of identifying leaky components of a multi-component nuclear reactor system in which the components contain a nuclear fuel charge, which includes in combination the steps of:

adding additional substances which are noble gases having different compositions, including different element and isotope compositions, to the charges of the respective components;

collecting from the used air of the nuclear reactor those portions of the nuclear fuel charges which escape in the event of leaks;

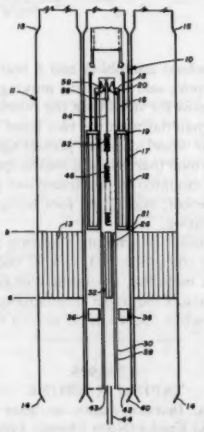
subjecting said collected portions to appropriate element and isotope analysis of said additional substances, prior to the analysis, separating the additional substances chemically and/or physically from the portions of the charge escaping in the event of leaks, optically determining the composition of the additional substances, the isotope composition of the additional substances being determined by optical saturation spectroscopy, determining the absorption of radiation from a variable-frequency laser in a cell filled with the sample substance as a function of the wavelength, and eliminating the collision and Doppler broadening by measuring the Lamb Dip at reduced pressure.

4,204,909

TEMPERATURE SENSITIVE SELF-ACTUATED SCRAM MECHANISM

Nicholas Giuggio, East Longmeadow, Mass.; Richard C. Noyes, New Britain, and Shakir U. Zaman, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 10, 1977, Ser. No. 805,251
Int. Cl.[2] G21C 7/06, 7/08, 7/10
U.S. Cl. 176—22 23 Claims



1. An apparatus for inferring the core average outlet temperature in a liquid metal-cooled nuclear reactor and rapidly dropping poison material into the reactor core upon occurrence of a critical value of the temperature, comprising:

a. said reactor core having a liquid metal coolant flow therethrough;

b. a safety duct located in said reactor core and extending upward above said core;

c. a vertical reactor coolant flow path through said duct;

d. at least one fuel pin axially disposed in said safety duct and within said coolant flow path;

e. temperature responsive actuating means located in said flow path above said fuel pins, said actuating means including a fixed mass of sensor fluid confined to expand or contract in response to the temperature of the coolant in the flow path above said fuel pins, whereby a linear motion is imparted to a portion of said actuating means;

f. a poison bundled including neutron absorbing poison material movably located in said duct; and

g. holding means operatively connected between said poison bundle and said actuating means for suspending said poison bundle above said core and for releasing said poison bundle upon a predetermined motion of said actuating means.

4,204,910

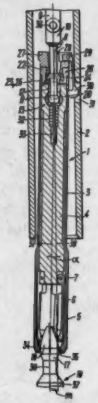
GRIPPING MEANS FOR REFUELLING A NUCLEAR REACTOR

Jury N. Koshkin, ulitsa Zvezdinka, 3, kv. 10; Georgy V. Ordynsky, ulitsa Strazh revoljutsii 9/6, kv. 9; Tsolak G. Shkhiyan, naberezhnaya imeni Zhdanova, 6, kv. 12; Alexandr F. Shapkin, ulitsa Zvezdinka, 3, kv. 64; Alexandr I. Fadeev, ulitsa Engelsa, 21, kv. 46; Fedor V. Laptev, prospekt Lenina, 57, kv. 31; Vladimir I. Batjukov, ulitsa Prygunova, 9, kv. 29; Konstantin I. Korolkov, ulitsa Shalyapina, 19, kv. 77, and Ivan V. Borodin, ulitsa Shalyapina, 15, kv. 2, all of Gorky, U.S.S.R.

Filed Aug. 24, 1977, Ser. No. 827,331

Int. Cl.[2] G21C *19/20*; B66C *17/08*, *1/10*

U.S. Cl. 176—30 4 Claims



1. In a refuelling machine for a nuclear reactor, containing a manipulator tube driven by means of a drive and provided with longitudinally extending grooves on its internal surface, having end walls, a gripping means arranged inside said manipulator tube and comprising:

a housing;

a slider accomodated in said housing and having a first end and a second end, said slider having a hole provided at its first end;

thrust pins having a longitudinal axis, mounted on said slider and interacting with said longitudinally extending grooves;

a working member intended to grip the head of a fuel assembly of said nuclear reactor and pivotably secured at said second end of said slider;

a rod mounted on said housing and driven by said drive;

a spherical lug provided on said rod, received in said hole of said slider and interacting with the surface of said slider, thus forming a first articulated joint having a center, whereby said slider is mechanically coupled to said rod.

4,204,911

METHOD AND APPARATUS FOR REMOVING IODINE FROM A NUCLEAR REACTOR COOLANT

Martin H. Cooper, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 493,373, Jul. 31, 1974, abandoned, which is a continuation of Ser. No. 263,054, Jun. 15, 1972, abandoned. This application Mar. 16, 1976, Ser. No. 668,162

Int. Cl.[2] G21C *19/30*

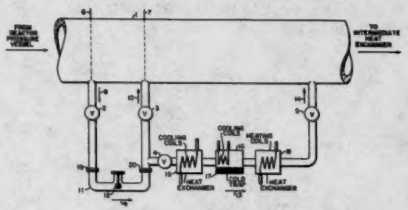
U.S. Cl. 176—37 16 Claims

1. A method for continuously removing iodine-131 and iodine-125 from a liquid sodium reactor coolant of a nuclear reactor, said method comprising the steps of

diverting a portion of said reactor coolant from a location in the main stream of said nuclear reactor to a bypass system,

adding non-radioactive iodine to said reactor coolant by passing said diverted coolant over a solid body containing said non-radioactive iodine,

then lowering the temperature of said diverted reactor coolant,



precipitating said iodine-131 and iodine-125 from said bypassed reactor coolant,

and reintroducing said bypassed reactor coolant into said main stream downstream of the point of said diverting location.

4,204,912

METHOD AND APPARATUS FOR PURIFYING GASES LEAKING FROM COKE OVENS

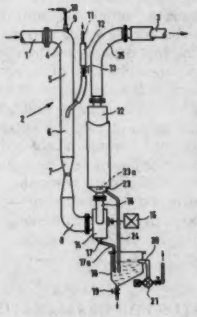
Fritz Schulte, Meerbusch-Büderich, and Wilfried Hürter, Essen, both of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 8, 1978, Ser. No. 958,667

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2750139

Int. Cl.[2] C10B *27/00*

U.S. Cl. 201—29 8 Claims



6. A method for treating the tar-containing gases leaking from the oven door of a coke oven by separating tar from the gases in a manner to avoid substantial plugging of the apparatus and to substantially reduce the probability of explosion comprising the steps of:

sucking said gases through at least one extraction device located at the point of leakage and thereafter through a collection duct connected thereto and into an extractor fan;

spraying hot ammonia liquor into the gases within the upstream portion of the collection duct; and

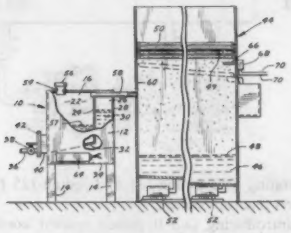
introducing saturated steam into said gases dispersed through the ammonia liquor spray.

4,204,913

SOLVENT RECOVERY APPARATUS

Winston E. Sabatka, Lakeville, Minn., assignor to Finishing Equipment, Inc., St. Paul, Minn.

Filed Apr. 6, 1978, Ser. No. 894,045
Int. Cl.[2] B01D *3/00*; B08B *7/04*
U.S. Cl. 202—168 **1 Claim**



1. In combination with a treatment tank having therein a first volatile treatment fluid having at least a first relatively highly volatile ingredient which is non-flammable in vapor phase and having at least a second ingredient which is flammable in vapor phase and relatively less volatile than said first ingredient and having therein a second treatment fluid having at least one ingredient which is more highly volatile than the second ingredient in said first fluid and which, when heated, forms a heavier-than-air vapor phase over its liquid phase, and in combination with treatment means for applying heat energy to a bottom portion of said treatment tank to cause said second fluid to form in said tank such a vapor phase over such a liquid phase, a treatment fluid recovery apparatus for recovering said first volatile treatment fluid from a mixture of said first fluid and non-volatile constituents; said treatment fluid recovery apparatus including:

A. a boiling vessel;

B. means to introduce a mixture of such a first volatile fluid and non-volatile constituents into said vessel;

C. energy means to continuously add heat energy to said mixture to cause said first fluid to progressively and continuously vaporize; and

D. transfer means to continuously introduce vapor from said first fluid in said boiling vessel into said tank above the top surface of the liquid phase of such second volatile fluid and below a vapor phase of such second volatile fluid;

E. control means to initiate and interrupt the application of heat energy to said mixture in said boiling vessel; and

F. a "vapor-up" measuring device associated with said tank operative on said control means to allow said control means to initiate application of heat energy to said mixture in said boiling vessel only when the vapor phase of said second fluid is above a predetermined upper position in said tank above the point of discharge of vapor from said first fluid into said tank.

4,204,914

APPARATUS FOR DESALINATING WATER

Richard E. Diggs, 12A Rd., Carthage, Mo. 64836

Division of Ser. No. 625,850, Oct. 28, 1975, Pat. No. 4,118,283.
This application Jan. 12, 1978, Ser. No. 868,999
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.[2] C02B *1/04*; B01D *3/10*; F24J *3/02*
U.S. Cl. 202—176 **8 Claims**

1. A distillation device comprising:

a first water transfer means for withdrawing contaminated water from a body of water having solid contaminants dissolved therein;

a grid connected to said first water transfer means so that contaminated water received from said body of water flows across said grid, said grid having an outer peripheral edge and an inner peripheral edge and comprising a header located on said grid outer peripheral edge and fluidly connected to said first water transfer means so that contaminated water flows into said header from the body of water, said header being fluidly attached to said grid so that contaminated water flows from said header onto said grid whereby contaminated water flows from the body of water to said grid via said header, and a trough located on said grid inner peripheral edge and fluidly attached to said grid so that contaminated water flows into said trough from said grid, and means for transferring solar energy to said water flowing across said grid;

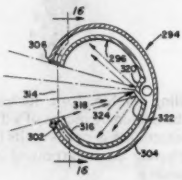
a water storage means having a side wall attached to said grid trough so that contaminated water flowing on said grid flows into said water storage means via said trough;

second water transfer means connected with said water storage means for removing contaminated water from said storage means;

a third water transfer means located in said trough and connected to said water storage means for transferring water from said trough to said water storage means and temperature control means connected to said third water transfer means for actuating said third water transfer means when the temperature of said water in said trough reaches or exceeds said predetermined temperature so that only water having a temperature which equals or exceeds said predetermined temperature is transferred to said water storage means;

a heat exchange structure connected to said water storage means;

a recirculation apparatus mounted in said trough and connected to said header for recirculating said water from said trough back to said header prior to transferring water from said trough into said water storage means and temperature control means connected to said recirculation apparatus for actuating said apparatus when the temperature of said water in said trough falls below a predetermined temperature;



a vaporizer means connected to said heat exchange structure for separating said water from said solid contaminants dissolved therein, said vaporizer means having a solar concentrator means for transferring solar energy to said contaminated water flowing from said heat exchange structure into said vaporizer means;

vacuum producing means for producing a vacuum in said vaporizer means so that said contaminated water is vaporized under vacuum conditions to form water vapor and thereby separate said water from said solid contaminants, and solid removing means connected to said vaporizer means for removing said solid contaminants from said vaporizer means;

water vapor transfer means connected to said vaporizer means for removing said water vapor from said vaporizer means;

condenser means connected to said water vapor transfer means for condensing said water vapor to form distilled water which is free of solid contaminants; and

distillate transfer means connected to said condenser means for withdrawing condensed water from said condenser means; and

a heat exchange means, said heat exchange means comprising:

a hollow case having inner walls and defining a chamber therewithin;

a plurality of fins located in said chamber and each having one end connected to one of said inner walls and a free end spaced from said inner walls, said fins being connected to said case so that adjacent fins are connected to opposite walls of the case, thereby positioning the free end thereof immediately adjacent the connected end of fins located adjacent thereof to form a tortuous path through said chamber for conducting water used in a distillation process through said chamber.

4,204,915

PROCESS FOR AZEOTROPIC DISTILLATION

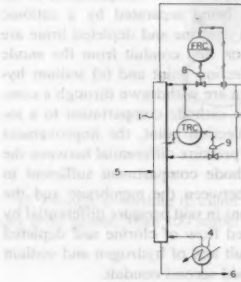
Kenzi Kurata, Iwakuni; Toshito Fukumoto, Otake; Yuji Yoshida, Iwakuni; Masanori Kusama, Otake, and Shintaro Tsuruta, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Mar. 17, 1978, Ser. No. 887,609

Claims priority, application Japan, Mar. 19, 1977, 52/29783

Int. Cl.[2] B01D *3/36, 3/42;* **C07C** *51/46, 29/28*

U.S. Cl. 203—2 **8 Claims**



1. A process for separating a compound from a mixture of water and the compound which comprises:

(a) distilling the mixture in a distillation column in the presence of an entrainer which forms an azeotrope with the water in an azeotropic zone of the column;

(b) separating the azeotrope as an overhead fraction;

(c) condensing the azeotrope to form a water-rich phase and an entrainer-rich phase;

(d) refluxing a first portion of the entrainer-rich phase into the upper region of the azeotropic zone through a first entrainer feed and a second portion into the lower region of the azeotropic zone through a second entrainer feed;

(e) detecting the temperature in the lower region of the azeotropic zone; and

(f) controlling the amount of entrainer refluxed through the second entrainer feed based on the temperature so as to suppress a temperature change in the lower azeotropic zone.

4,204,916

PROCESS FOR RECOVERING ACID CHLORIDES BY DISTILLATION

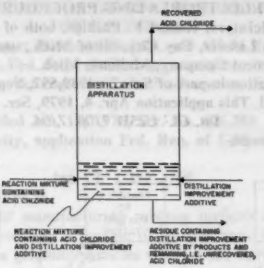
Thomas F. Cisco, Ardsley; George E. Hansen, Yorktown Heights, both of N.Y., and Robert N. Agate, Freehold, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

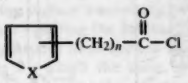
Filed Dec. 30, 1977, Ser. No. 866,138

Int. Cl.[2] B01D *3/34*

U.S. Cl. 203—6 **7 Claims**

1. A process for recovering an acid chloride having the structure:


RECOVERED ACID CHLORIDE
DISTILLATION APPARATUS
REACTION MIXTURE CONTAINING ACID CHLORIDE
DISTILLATION IMPROVEMENT ADDITIVE
REACTION MIXTURE CONTAINING ACID CHLORIDE AND DISTILLATION IMPROVEMENT ADDITIVE
RESIDUE CONTAINING DISTILLATION IMPROVEMENT ADDITIVE BY PRODUCTS AND REMAINING (I.E. UNRECOVERED) ACID CHLORIDE



wherein X is a divalent oxygen or divalent sulfur atom, and n has the value 0, 1, 2, or 3, from a non-aqueous mixture containing the same, comprising distilling the acid chloride from the mixture in the presence of an effective quantity of a distillation improvement additive which is a mineral oil or an organopolysiloxane, wherein the distillation improvement additive remains substantially liquid under the conditions of distillation and the effective quantity of distillation improvement additive is from about 25% to about 300% based on the weight of the acid chloride.

4,204,917

METHOD FOR MEASURING ION ACTIVITY

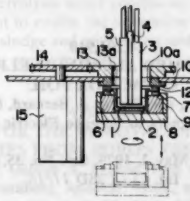
Tadao Yamamoto, Machida; Hiroshi Takekawa, Kunitachi; Taichi Banno, Hachioji, and Kiyozo Koshiishi, Sagamihara, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Division of Ser. No. 739,052, Nov. 5, 1976. This application Dec. 18, 1978, Ser. No. 970,239

Claims priority, application Japan, Nov. 10, 1975, 50-134836

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **11 Claims**



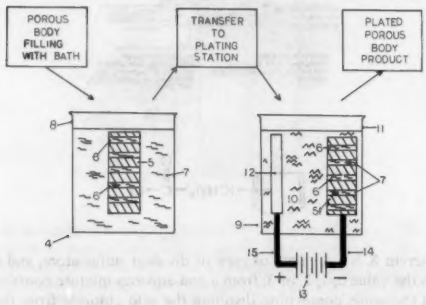
1. A method of measuring ion activity comprising placing a cup filled with test solution to be measured on a cup receiver, lifting a cup lifting arm to engage said cup receiver with a rotary plate, rotating the cup by rotating said rotary plate to stir the test solution in the cup, measuring a potential difference between a reference electrode and another electrode after completion of the stirring of the solution, and indicating the ion activity to be measured.

4,204,918

ELECTROPLATING PROCEDURE

James A. McIntyre; Robert F. Phillips, both of Midland, and Joseph D. Lefever, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 939,597, Sep. 5, 1978, abandoned. This application Apr. 4, 1979, Ser. No. 26,861
Int. Cl.[2] C25D 7/00, 7/04
U.S. Cl. 204—24 15 Claims



1. Procedure for providing internal surface deposit layers on the walls of void spaces in a porous electroconductive body comprising:

at least substantially filling the void space in the porous body with a bath of a therein dispersed electrodepositable substance which forms deposit layers on an oppositely electrocharged body when subject to passage therethrough of a deposit-forcing electrical current;

immersing the bath-replete porous body in an electroconductive liquid medium that is different than the bath and which in itself contains substantially nothing of a deposit-releasing nature when the liquid is subject to passage of electrical current therethrough; then

applying a direct electrical potential across the liquid and to said bath-replete body to cause current to flow through said liquid and body whereupon interior deposits are laid on the internal surface areas of said body from said bath occupying the void space therein.

4,204,919

TREATING ETCHED ALUMINUM ELECTROLYTIC CAPACITOR FOIL

John J. Randall, Jr., and Walter J. Bernard, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 2, 1979, Ser. No. 35,145
Int. Cl.[2] C25D 11/16
U.S. Cl. 204—29 10 Claims

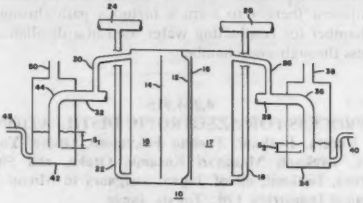
1. Aluminum electrolytic capacitor foil is treated prior to anodization in a two-step process comprising contacting said foil with boiling water and then contacting said foil with a boiling aqueous solution containing ions chosen from the group consisting of phosphate, tartrate, silicate, and combinations thereof, whereby a hydrous oxide film formed in the first step is modified by interaction with said ions of the second-step so that capacitance is enhanced and power consumption reduced in subsequent anodization.

4,204,920

ELECTROLYTIC PRODUCTION OF CHLORINE AND CAUSTIC SODA

Bruce E. Kurtz, Marcellus, and Robert H. Fitch, Syracuse, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 6, 1978, Ser. No. 966,923
Int. Cl.[2] C25B 1/16, 1/26
U.S. Cl. 204—98 4 Claims



1. In a process for the electrolysis of sodium chloride brine wherein (a) aqueous brine is introduced into the anode compartment of an electroytic cell, (b) water or aqueous sodium hydroxide is introduced into the cathode compartment of the cell, (c) said compartments being separated by a cationic permselective membrane, (d) chlorine and depleted brine are withdrawn through a common first conduit from the anode compartment to a brine collection point and (e) sodium hydroxide solution and hydrogen are withdrawn through a common second conduit from the cathode compartment to a sodium hydroxide solution collection point, the improvement which comprises providing a pressure differential between the anode compartment and cathode compartment sufficient to prevent substantial contact between the membrane and the anode and reducing fluctuations in said pressure differential by maintaining free, uninterrupted flow of clorine and depleted brine through said first conduit and of hydrogen and sodium hydroxide solution through said second conduit.

4,204,921

METHOD FOR REJUVENATING CHLOR-ALKALI CELLS

Wayne E. Britton, Plano, Tex., and Michael Krumpelt, Naperville, Ill., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 19, 1979, Ser. No. 21,354
Int. Cl.[2] C25B 1/26, 1/16
U.S. Cl. 204—98 4 Claims

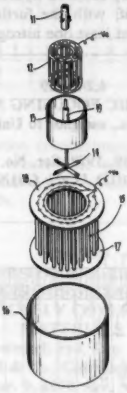
1. In a chlor-alkali cell having an anode, a cathode and a membrane separating the cell into an anolyte compartment and a catholyte compartment, and wherein cell efficiency is reduced by build-up of deposits containing calcium and magnesium, a method of rejuvenating the cell and cathode comprising the step of adding an acid to the catholyte compartment in an amount sufficient to reduce the pH of the catholyte below pH 8, said acid having an anion of the class which forms soluble salts with both calcium and magnesium, the cell current being maintained at the normal operating level while the acid is added to the catholyte chamber.

4,204,922

SIMULTANEOUS ELECTRODISSOLUTION AND ELECTROWINNING OF METALS FROM SIMPLE SULPHIDES

Donald B. Fraser, Rankin Park; Alexander Dim, Speers Point; Kevin E. Anthony, Cardiff; Wayne R. Costello, Dudley, and Phillip E. Grazier, Kilaben Bay, all of Australia, assignors to The Broken Hill Propietary Company Limited, Melbourne, Australia

Filed Nov. 28, 1978, Ser. No. 964,351
Claims priority, application Australia, Dec. 6, 1977, PD2671
Int. Cl.[2] C25C *1/00, 1/06, 1/12, 1/16*
U.S. Cl. 204—105 R 13 Claims



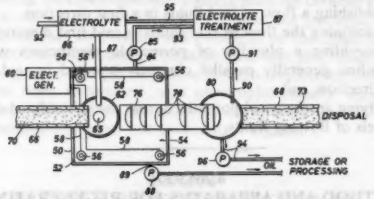
13. Process according to claim **12**, wherein the current density is no greater than 100 ampers per square meters.

4,204,923

METHOD AND APPARATUS FOR RECOVERY OF HYDROCARBONS FROM TAR-SANDS

Neil L. Carpenter, 175 Nimitz Rd., Kerrville, Tex. 78208

Filed Jun. 8, 1978, Ser. No. 913,629
Int. Cl.[2] C25B *1/02, 1/00*
U.S. Cl. 204—129 55 Claims



1. A method of releasing bitumen forming a component of an earth aggregate, comprising the steps of

electrically insulating a preselected volume of the earth aggregate containing the bitumen and an electrolyte dispersed therein from substantially all earth material adjacent thereto, and

establishing an electrical current flow through said electrolyte dispersed in the earth aggregate for electrochemically breaking the molecular bond of the bitumen from the earth aggregate material and releasing the bitumen therefrom.

4,204,924

METHOD OF MANUFACTURING RUBBING SURFACES OF CAST IRON

Rudolf Harlfinger; Theobald Ehehalt, and Alfred Kappes, all of Neckarsulm, Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jun. 15, 1976, Ser. No. 696,384
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1975, 2531013
Int. Cl.[2] C25F *3/06*
U.S. Cl. 204—129.35 2 Claims

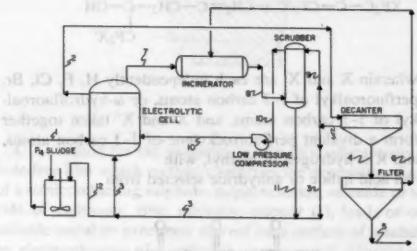
1. Method of manufacturing rubbing surfaces of cast iron comprising providing a perlitic or ferritic basic structure or matrix and free graphite particles wherein the rubbing surface is machined to its final dimensions and as a result of this machining particles of the basic structure or matrix are smeared over the graphite, the rubbing surface is then degreased, and thereafter the rubbing surface is subjected to an electro-chemical etching process by placing the rubbing surface in an electrolyte in which electrodes have applied between them a predetermined voltage by which the basic structure or matrix which has been smeared over the graphite particles by the machining step is etched away to expose the graphite particles so that the rubbing surface can immediately be put under full load without any running-in period.

4,204,925

RECOVERY OF PHOSPHORUS FROM SLUDGE

Miguel Coll-Palagos, Rye, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 11, 1977, Ser. No. 786,728
Int. Cl.[2] C25B *1/00*
U.S. Cl. 204—152 22 Claims



1. A process for recovering elemental phosphorus from sludge derived from the production of elemental phosphorus by the smelting of phosphate rock which comprises subjecting said sludge to electrolysis under conditions of voltage, current and time sufficient to enable the separation of elemental phosphorus from said sludge and recovering said separated elemental phosphorus by recovery means.

4,204,926

METHOD FOR THE REMOVAL OF PHOSGENE IMPURITIES FROM BORON TRICHLORIDE

Harry C. Meyer; George A. Tanton, both of Huntsville, Ala.; Raymond I. Greenberg, Andover, Mass., and Joe E. Williams, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1979, Ser. No. 21,037
Int. Cl.[2] B01J *1/10*; B01K *1/00*; C01B *35/06*
U.S. Cl. 204—157.1 H 5 Claims

1. A method for the removal of phosgene impurities from boron trichloride comprising:

(i) Admitting a gaseous mixture of BCl_3 containing $COCl_2$ as an impurity into a reaction cell to achieve a predetermined pressure in said reaction cell that is operable with the

electrical excitation energy level employed to effect decomposition of said $COCl_2$ impurity;

(ii) delivering an electrical excitation energy level for a predetermined time period through said gaseous mixture to effect decomposition of said $COCl_2$ impurity;

(iii) monitoring said $COCl_2$ impurity concentration level to determine when all of said $COCl_2$ impurity has been decomposed; and,

(iv) repeating said step of delivering an electrical excitation energy level when said monitoring step determines that $COCl_2$ impurity is present in said reaction cell.

4,204,927

CROSSLINKING OF ESTERIFIED FLUOROCARBON POLYMER

Dana P. Carlson, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 680,874, Apr. 27, 1976, abandoned. This application Jan. 20, 1978, Ser. No. 871,116

Int. Cl.[2] C08J *3/28, 7/10;* **C08F** *8/14*

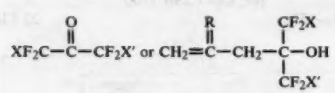
U.S. Cl. 204—159.18 **2 Claims**

1. Process for crosslinking an esterified polymer of

(a) 40–60 mole percent ethylene,

(b) 60–40 mole percent tetrafluoroethylene or chlorotrifluoroethylene, said mole percents being based on (a) and (b) monomers present, and

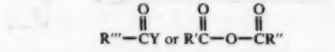
(c) 0.1 to 30 weight percent, based on weight of (a) (b), and (c) monomers present, of the esterification reaction product of



(1)

wherein X and X′ are each independently H, F, Cl, Br, perfluoroalkyl of 1–3 carbon atoms, or ω-hydrofluoroalkyl of 1–3 carbon atoms, and X and X′ taken together form a divalent perfluoroalkylene of 1–3 carbon atoms, and R is hydrogen or methyl, with

(2) an acid halide or anhydride selected from



wherein Y is Cl, Br or F; and R′, R″ or R‴ each independently is aryl of 6–10 carbon atoms,

which comprises subjecting said esterified polymer in the absence of other materials to ultraviolet radiation.

4,204,928

PHOTOPOLYMERIZABLE COMPOSITION STABILIZED WITH NITROGEN-CONTAINING AROMATIC COMPOUNDS

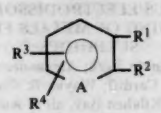
Francis A. Via, Yorktown Heights, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 773,370, Mar. 1, 1977, Pat. No. 4,141,807. This application Oct. 10, 1978, Ser. No. 950,208

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **12 Claims**

1. A process for preparing a photopolymerizable composition comprising forming a mixture containing a photopolymerizable ethylenically unsaturated compound, a benzoin ether in an amount sufficient to initiate photopolymerization and a stabilizing amount of a stabilizer having the formula:



wherein A is a carbon or nitrogen; R^1 and R^2 are independently selected hydrogen or —X—R^5 where X is zero, oxygen, sulfur, N=N, S—S, —R^6 or N—R^6 where R^6 is hydrogen or alkyl of 1 to 6 carbon atoms, and R^5 is phenyl or pyridyl with the proviso that both R^1 and R^2 cannot be hydrogen; and R^3 and R^4 are independently selected hydrogen, hydroxyl, or an alkali metal salt thereof; with the further proviso that said stabilizer must contain at least one nitrogen.

4,204,929

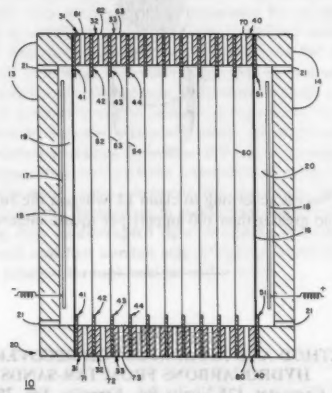
ISOELECTRIC FOCUSING METHOD

Milan Bier, Tucson, Ariz., assignor to University Patents, Inc., Norwalk, Conn.

Filed Apr. 18, 1978, Ser. No. 897,261

Int. Cl.[2] B01D *13/02;* **G01N** *27/26*

U.S. Cl. 204—180 R **42 Claims**



1. A method for isoelectric focusing of fluids containing buffering components capable of establishing a stable pH gradient in an electric field, comprising the steps of:

establishing a flow of said fluids in a first direction;

streamlining the flow of said fluids in said first direction by providing a plurality of permeable membranes which define generally parallel channels oriented in said first direction; and

applying an electrical potential across the streamlined channels of flowing fluids.

4,204,930

METHOD AND APPARATUS FOR REGENERATING SPENT PHOTOGRAPHIC BLEACH-FIXER SOLUTION

Takezo Ono, Kodaira; Seiki Iribe, and Mineo Watanabe, both of Mihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

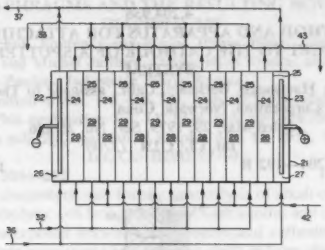
Filed Apr. 13, 1979, Ser. No. 29,866

Int. Cl.[2] B01D *13/02*

U.S. Cl. 204—180 P **6 Claims**

1. A method for regenerating a spent bleach-fixer solution by electrodialysis using an electrodialysis cell comprising a cathode, an anode and alternating anion exchange membranes and cation exchange membranes arranged therebetween to define a cathode compartment, a plurality of intermediate enionation

and deionation compartments with a set of the deionation compartments alternately disposed between a set of the enionation compartments, and an anode compartment; said method comprising filling an electrolyte solution in the cathode com-



partment, the enionation compartments and anode compartment, and the spent bleach-fixer solution in the deionation compartments, and passing a direct electric current across the cathode and the anode.

4,204,931

PROCESS FOR THE PRE-TREATMENT OF NON-FERROUS METALS TO BE ELECTROPHORETICALLY COVERED WITH CERAMIC MATERIALS

Jürgen Neisen, Harsewinkel, Fed. Rep. of Germany, assignor to Miele & Cie GmbH & Co., Gutersloh, Fed. Rep. of Germany

Filed Mar. 9, 1978, Ser. No. 884,867

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710122

Int. Cl.[2] **C25D** *13/02, 13/20*

U.S. Cl. 204—181 N **2 Claims**

1. A process for coating a non-ferrous metal with a ceramic material for dental applications, comprising the steps of:

zinc plating by electrolysis a non-ferrous base material to produce a metallic zinc layer thereon; and

electrophoretically applying to said plated base material an even layer of ceramic material, said electrophoretically applying step simultaneously causing said zinc layer to convert into zinc oxide by electrolysis, and said zinc layer being initially adjusted to a sufficient thickness such that the conversion time of the entire metallic zinc layer into zinc oxide coincides with the concurrent electrophoretic coating time, thereby avoiding, on the one hand, that during the electrophoretic coating with the ceramic material the entire metallic zinc will have not yet been converted into zinc oxide, and avoiding, on the other hand, that the conversion of metallic zinc into zinc oxide will have been completed before the electrophoretic coating has been terminated, said electrophoretically applying step lasting only a few seconds, and said thickness of said metallic zinc layer not exceeding 1 mg/cm^2.

4,204,932

PROCESS FOR ELECTRODEPOSITION OF COMPOSITIONS CONTAINING CARBAMOTHIOATE CURING AGENTS

Vincent D. McGinniss, Valley City, and Donald R. Stevenson, Dover, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 812,801, Jul. 5, 1977, Pat. No. 4,133,916. This application Sep. 18, 1978, Ser. No. 942,994

Int. Cl.[2] **C25D** *13/10*

U.S. Cl. 204—181 R **9 Claims**

1. An electrocoating process for coating a substrate with an electrocoating composition dispersed in an aqueous electrocoating bath, which comprises:

electrodepositing said electrocoating composition onto said substrate, said composition comprising: a compound A containing at least about two functional groups each reactive with an isocyanate group, a compound B containing at least about two functional groups each reactive with a mercaptan group, and a carbamothioate curing agent adapted to generate a plurality of curing units upon being heated to above about critical temperature, said curing units containing at least two isocyanate groups and at least two mercaptan groups with at least one of said curing units containing at least two of said groups; and

heating said coated substrate to a temperature above about said critical temperature to generate said plurality of curing units to cure said coating.

4,204,933

ELECTROCOATING PROCESS FOR PRODUCING A SEMICONDUCTING FILM

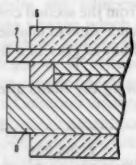
William A. Barlow; Maurice Rhodes; Francis R. Sherliker, and Edward W. Williams, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 27, 1978, Ser. No. 955,244

Claims priority, application United Kingdom, Nov. 15, 1977, 47443/77

Int. Cl.[2] **C25C** *15/00;* **C25D** *13/02*

U.S. Cl. 204—181 N **20 Claims**



1. A method for the preparation of a thin substantially pinhole-free film which method comprises the deposition of a film of a semiconducting sulphide, sulphoselenide, selenide or telluride of cadmium, zinc, mercury, copper (I), lead, or other suitable metal or precursor thereof on a surface of a substrate by electrophoresis of a colloidal suspension of colloidal particles of the semiconductor or precursor thereof in an aqueous medium, said particles having an average diameter between 1 and 100 nm, and the application of heat preferentially to a first surface of the film to raise the temperature of the said first surface to between 300° C. and 600° C. while the temperature of a second surface of the film is kept below 100° C.

4,204,934

PROCESS FOR APPLICATION OF ELECTROSTATIC FIELDS TO MIXING AND SEPARATING FLUIDS

Kenneth W. Warren, Jenks, and Floyd L. Prestridge, Mounds, both of Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 892,612, Apr. 3, 1978, Pat. No. 4,161,439. This application Feb. 21, 1979, Ser. No. 12,997

Int. Cl.[2] **B03C** *5/00*

U.S. Cl. 204—186 **6 Claims**

1. A process for first mixing and then separating two fluids which are immiscible and wherein one fluid is more polar than the other fluid, including,

passing both fluids into a first common zone,

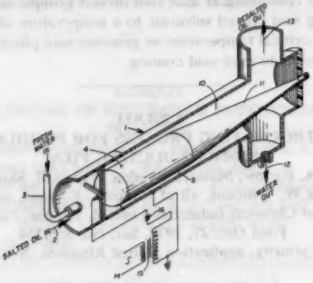
generating an electrostatic field of a first intensity in the first common zone at which intensity drops of the more polar of the two fluids will be moved by the field force fast

enough to shear into smaller sizes of drops and distribute throughout the less polar of the fluids,

maintaining the fluids in the first common zone for a first predetermined residence time,

flowing the mixture of fluids from the first common zone to a second common zone,

generating an electrostatic field of a second intensity less than the first intensity in the second common zone to provide a force on the droplets of the more polar of the



two fluids to move the droplets into collision with each other and coalesce into drops of larger size,

maintaining the fluids in the second common zone for a second predetermined residence time,

passing the fluids from the second common zone and providing a third residence time to enable the coalesced drops of the more polar fluid to gravitate from the remaining fluid and separate,

and separately flowing the fluids after they have gravitated from each other.

4,204,935

THIN-FILM RESISTOR AND PROCESS FOR THE PRODUCTION THEREOF

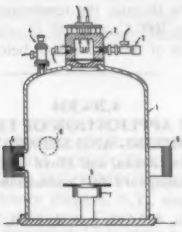
Fritz Klesse, Landshut, and Jürgen Förster, Freising, both of Fed. Rep. of Germany, assignors to Resista Fabrik Elektrischer Widerstände G.m.b.H., Landshut, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 764,015, Jan. 31, 1977, abandoned. This application May 23, 1978, Ser. No. 908,679

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605174

Int. Cl.[2] **C23C** *15/00;* **H01C** *7/06*

U.S. Cl. 204—192 F **10 Claims**



1. Process for the production of a thin-film resistor with an insulating carrier member and a resistor film applied to the carrier member, comprising the steps of:

depositing the resistor film on the insulating carrier member by reactive sputtering of the metals chromium and nickel with an added amount of at least one of the metals selected from the group consisting of gold, cobalt, aluminum, and tin, the composition of said film being 30–80 mole percent chromium or chromium compound, 10–35 mole percent nickel or nickel compound and 10–35 mole percent of said added metal or metals, in the presence of oxygen having a partial pressure of from 1×10^{-6} to 1×10^{-4} Torr.

4,204,936

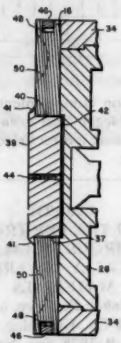
METHOD AND APPARATUS FOR ATTACHING A TARGET TO THE CATHODE OF A SPUTTERING SYSTEM

Larry D. Hartsough, Berkeley, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 29, 1979, Ser. No. 25,226

Int. Cl.[2] **C23C** *15/00*

U.S. Cl. 204—192 R **17 Claims**



1. A method for attaching a target to a sputtering cathode assembly including a backing plate and a magnetic subassembly coupled to said backing plate, the method comprising the steps of,

positioning a first surface of said target against a surface of said backing plate, and

placing a ferromagnetic retainer against a second surface of said target so that said retainer is attracted to said magnetic subassembly means with sufficient force to firmly hold said target to said backing plate.

4,204,937

NOVEL ELECTROLYTIC AMALGAM DENUDER APPARATUS

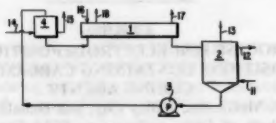
Giuseppe Bianchi; Oronzio deNora, both of Milan, Italy, and Placido M. Spaziante, Lugano, Switzerland, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 906,656, May 16, 1978, Pat. No. 4,166,780. This application Feb. 28, 1979, Ser. No. 16,191

Claims priority, application Italy, Jan. 24, 1978, 19560 A/78

Int. Cl.[2] **C25B** *1/44, 11/12, 11/18*

U.S. Cl. 204—219 **4 Claims**



1. An amalgam denuder comprising a container filled with a catalytic material, means for introducing amalgam at the top of the container, means for introducing water at the bottom of the container, means for removing hydrogen at the top of the container, means for removing alkali metal hydroxide solution at the top of the container, a divider plate separating the container from a chamber provided at the bottom of the container for collecting mercury and provided with a negatively charged

counter-electrode above the mercury and water and means for removing mercury from the chamber.

4,204,938

METHOD OF MAKING POROUS PLASTIC DIAPHRAGMS AND THE RESULTING NOVEL DIAPHRAGMS

Jean Bachot, Fontenay-aux-Roses; Pierre Bouy, Enghien-les-Bains, and Michel Juillard, Orsay, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 686,723, May 17, 1976, abandoned. This application Jul. 14, 1978, Ser. No. 924,795

Claims priority, application France, Jun. 11, 1975, 75 18246

Int. Cl.[2] B29D *27/04*

U.S. Cl. 204—252 **17 Claims**

1. An electrolytic cell for the electrolysis of alkali chlorides, said electrolytic cell being equipped with anodes and cathodes, having interposed between said anodes and cathodes porous diaphragms consisting of an asbestos cloth of from about 0.5 to 1 millimeter thick, weighing less than about 500 grams per square meter, integrated with the anode face of a microporous, uniform membrane of substantially uniform pore size and comprising asbestos fibers, said membrane, being consolidated by a fluorinated polymer resin, said asbestos fibers of between about 0.5 and 50 millimeters in length, said diaphragm having a relative resistance less than about 4, a flow rate of liquid through the diaphragm of from about 0.25 to 0.02 milliliters per minute per square centimeter under 50 grams per square centimeter of liquid charge at 20° C. and said diaphragm being of total thickness of from about 2.5 to 5 millimeters.

2. A method of manufacturing porous electrolytic cell diaphragms which are consolidated by a fluorinated polymer resin, comprising agitating a suspension of asbestos fibers in water, a sulfonic anionic surfactant, a fluorinated polymer resin latex and a solid mineral pore-former, to form a stable, homogeneous suspension, depositing and filtering said suspension on an asbestos cloth reinforcing element to form a preform, drying the resulting preform, sintering the said fluorinated polymer resin by heat at a temperature above the crystalline melting point of said fluorinated polymer resin, removing said solid mineral pore-former to form a uniform, porous membrane having uniform pore size, integrated on its anode face to said asbestos cloth reinforcing element, wherein said asbestos cloth reinforcing element has a structure which is at least as open with respect to the passage of liquor as said uniform, porous, homogeneous membrane.

4,204,939

DIAPHRAGM CELL

Thomas W. Boulton, and Brian J. Darwent, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

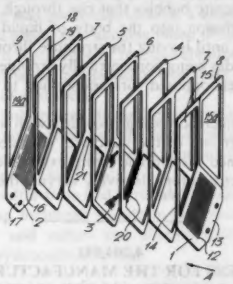
Filed Feb. 23, 1978, Ser. No. 880,878

Claims priority, application United Kingdom, Mar. 4, 1977, 9189/77

Int. Cl.[2] C25B *9/00, 11/03, 11/10, 1/16*

U.S. Cl. 204—258 **35 Claims**

1. A monopolar filter press electrolytic cell suitable for use in the electrolysis of aqueous alkali metal halide solution (hereinafter referred to as brine) to produce an aqueous alkali metal hydroxide solution (hereinafter referred to as cell liquor), halogen and hydrogen, which cell comprises a plurality of anode plates and cathode plates, and a hydraulically permeable diaphragm positioned between each adjacent anode plate and cathode plate, the anode plates comprising an anode portion of a film-forming metal which carries an electrocatalytically active coating, the cathode plates comprising a metallic cathode portion, characterised in that the cell comprises at least one spacing plate of a non-conducting material positioned between each anode plate and adjacent diaphragm and between each cathode plate and adjacent diaphragm, the anode plates, cathode plates and spacing plates being provided with at least two openings in the faces of the plates which, when the said plates are assembled into a filter press cell, define in combination a first compartment lengthwise of the cell and a second compartment lengthwise of the cell separated from the first compartment, the said compartments in the filter press cell being located above the anolyte and catholyte compartments of the cell defined respectively by the spaces between the anodes and diaphragms and the spaces between the cathodes and diaphragms, the anode portion of the anode plate and the cathode portion of the cathode plate and the diaphragm being of substantially the same shape and being of circular shape or of square or rhombus shape with the diagonals of the square or rhombus being substantially horizontal or vertical, the spacing



plates between the anodes and adjacent diaphragms being provided with at least one passage which permits brine to pass between the first compartment and the anolyte compartments and which permits halogen to be released from the anolyte compartments to the first compartment, and the spacing plates between the cathodes and adjacent diaphragms being provided with at least one passage which permits cell liquor and hydrogen to pass from the catholyte compartments to the second compartment, the cell being provided with end plates which provide end walls for the aforementioned first and second compartments, the anode plates and cathode plates being made in part of a non-conducting material so that the first and second compartments are electrically insulated from one another.

4,204,940

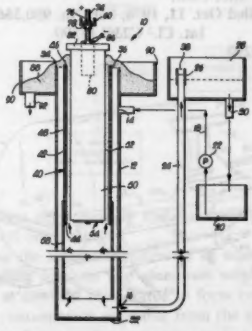
APPARATUS FOR PRODUCING FOAM

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Division of Ser. No. 807,051, Jun. 16, 1977, Pat. No. 4,120,765. This application May 11, 1978, Ser. No. 904,989

Int. Cl.[2] C25B *9/00, 15/08*

U.S. Cl. 204—272 **12 Claims**



1. Foam producing apparatus comprising:

containing means adapted to receive a body of foamable liquid and having a bottom;

tubular structure arranged in upright disposition within said containing means wholly above said bottom thereof and defining an upright passage,

said structure having an inlet to said passage adjacent the normally lower end of the structure and an outlet from said passage adjacent the normally upper end of the structure; and

a pair of opposed, oppositely charged electrodes associated with said structure and disposed at least in part on opposite sides of said upright passage whereby, when said containing means is supplied with said body of liquid to the level of said outlet, an electric field will be established within the part of said passage between said electrodes so as to generate bubbles that rise through the passage and avoid diffusion into the body of liquid outside of said structure until leaving the structure through said outlet,

said electrodes being concentrically arranged one within the other, their opposed surfaces serving to define said passage,

said other electrode being provided with a sleeve adjacent said lower end of the structure, said sleeve having said inlet defined therein and being extensible relative to the other electrode for selectively varying the position of said inlet.

4,204,941

PROCESS FOR THE MANUFACTURE OF A PERMEABLE DIAPHRAGM FOR AN ELECTROLYSIS CELL

Giuseppe Niccolini, Catiglioncello, Italy, assignor to Solvay & Cie, Belgium

Filed Oct. 5, 1978, Ser. No. 948,777

Claims priority, application Luxembourg, Oct. 19, 1977, 78350/77

Int. Cl.[2] C25B *13/06, 13/08*

U.S. Cl. 204—296 **12 Claims**

1. Process of manufacturing a liquid permeable diaphragm for a cell for the electrolysis of aqueous solutions of alkali metal halides, which comprises forming a sheet comprising inorganic fibres and a polymer in the form of finely divided solid dispersed in said sheet, said polymer being selected from amongst the polyelectrolytes which are insoluble in aqueous solutions of alkali metal halides, and heating said sheet to at least partially melt said polymer sufficiently for said polymer to coat said inorganic fibres partially and to weld them to one another.

4,204,942

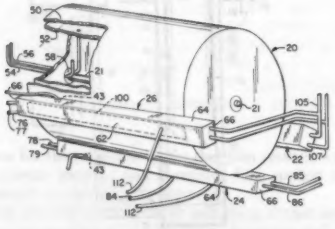
APPARATUS FOR MULTILAYER THIN FILM DEPOSITION

Day Chahroudi, Berkeley, Calif., assignor to Heat Mirror Associates, Palo Alto, Calif.

Filed Oct. 11, 1978, Ser. No. 950,356

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—298 **10 Claims**



1. Sputtering apparatus for thin film deposition of at least a first and a second material onto an elongate substrate having a predetermined transverse dimension, comprising:

an evacuable chamber including pump means connected thereto for lowering the interior pressure of the chamber;

at least a first and a second means for deposition of the first and second material, respectively, onto the substrate, each one of the deposition means being mounted interior of the chamber and including an enclosure having terminal portions forming an edge that defines an elongate opening;

means mounted interior of the chamber for transporting the substrate to and from the first and the second deposition means, the transport means including means for supporting a portion of the substrate proximate each one of the deposition means, positioning the substrate in confronting relation with the opening of each one of the enclosures to form a generally uniform interstitial gap between each said edge of each said enclosure and said supporting means; and means for introducing and maintaining a first and a second gas into the respective enclosure of the first and the second deposition means at pressures greater than the interior pressure of the chamber, said interstitial gap being configured and dimensioned to restrict outflow of said first and second gas from the respective enclosure of said first and second deposition means.

4,204,943

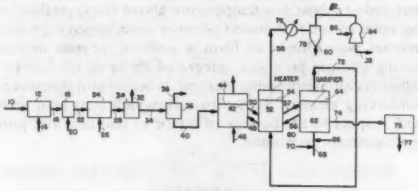
COMBINATION HYDROCONVERSION, COKING AND GASIFICATION

William J. Metrailer; Roby Bearden, Jr., and Clyde L. Aldridge, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 889,744, Mar. 24, 1978. This application Sep. 15, 1978, Ser. No. 942,689

Int. Cl.[2] C10G *37/06*

U.S. Cl. 208—50 **22 Claims**



1. A process for upgrading a liquid-containing carbonaceous chargestock which comprises:

(a) adding to said chargestock hydroconversion catalytic solids having an average particle size of less than about 10 microns in diameter to form a mixture, said solids being selected from the group consisting of fluid coke, delayed coke, coal coke, carbonaceous residue derived from the gasification of coke, an ash of said coke, an ash of said carbonaceous residue and mixtures thereof;

(b) reacting the chargestock containing said catalytic solids as a slurry with a molecular hydrogen-containing gas under hydroconversion conditions in a hydroconversion zone to produce an upgraded hydrocarbonaceous oil product;

(c) separating a heavy oil fraction from said hydrocarbonaceous oil product;

(d) subjecting at least a portion of said separated oil fraction to coking conditions in a coking zone to produce coke, and

(e) reacting at least a portion of said coke with steam and a molecular oxygen-containing gas to produce a hot gaseous stream containing hydrogen and a solid carbonaceous residue.

4,204,944

PROCESS FOR REMOVING POLLUTANTS FROM NONZEOLITIC CATALYST REGENERATOR FLUE GAS

Robert L. Flanders, San Anselmo, and William A. Blanton, Jr., Woodacre, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 786,724, Apr. 11, 1977, Pat. No. 4,115,251, which is a continuation-in-part of Ser. No. 666,115, Mar. 11, 1976, Pat. No. 4,071,436. This application Jul. 10, 1978, Ser. No. 923,426

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.[2] B01J *29/06;* **C01G** *11/04;* **C01B** *17/00*

U.S. Cl. 208—120 **10 Claims**

1. In a process for cracking hydrocarbons in the absence of added molecular hydrogen wherein a nonzeolitic cracking catalyst including of at least one acidic cracking component from the group consisting of silica-containing nonzeolitic crystalline refractory inorganic oxides and silica-containing amorphous refractory inorganic oxides is cycled between a cracking zone and a catalyst regeneration zone, a sulfur-containing hydrocarbon stream is cracked in contact with said catalyst in said cracking zone, and a sulfur-containing flue gas is formed in said regeneration zone by burning sulfur-containing coke off said nonzeolitic catalyst with an oxygen-containing gas, the method for reducing the amount of carbon monoxide and sulfur oxides in said flue gas which comprises:

(a) reacting carbon monoxide and oxygen to form carbon dioxide in said regeneration zone in contact with a carbon monoxide oxidation promoter comprising a metal or compound of a metal selected from platinum, palladium, iridium, rhodium, osmium, ruthenium and copper;

(b) forming a sulfur- and aluminum-containing solid in said regeneration zone by reacting sulfur trioxide with alumina, said alumina having a surface area of at least 50 square meters per gram and being included in a particulate solid physically admixed with said catalyst, said particulate solid being substantially free from said metal or metal compound; and

(c) removing sulfur from said particulate solid and forming hydrogen sulfide in said cracking zone by contacting said sulfur- and aluminum-containing solid with said hydrocarbon stream.

4,204,945

REMOVING POLLUTANTS FROM FLUE GAS IN NONZEOLITIC CATALYTIC CRACKING

Robert L. Flanders, San Anselmo, and William A. Blanton, Jr., Woodacre, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 786,723, Apr. 11, 1977, Pat. No. 4,115,250, which is a continuation-in-part of Ser. No. 666,115, Mar. 11, 1976, Pat. No. 4,071,436. This application Jul. 10, 1978, Ser. No. 923,427

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.[2] B01J *29/06;* **C01G** *11/04;* **C01B** *17/00*

U.S. Cl. 208—120 **4 Claims**

1. In a process for cracking hydrocarbons in the absence of added molecular hydrogen wherein a nonzeolitic cracking catalyst including of at least one acidic cracking component from the group consisting of silica-containing nonzeolitic crystalline refractory inorganic oxides and silica-containing amorphous refractory inorganic oxides is cycled between a cracking zone and a catalyst regeneration zone, a sulfur-containing hydrocarbon stream is cracked in contact with said catalyst in said cracking zone, and a sulfur-containing flue gas is formed in said regeneration zone by burning sulfur-containing coke off said nonzeolitic catalyst with an oxygen-containing gas, the method for reducing the amount of carbon monoxide and sulfur oxides in said flue gas which comprises:

(a) reacting carbon monoxide and oxygen to form carbon dioxide in said regeneration zone in contact with a carbon monoxide oxidation promoter comprising a metal or compound of a metal selected from platinum, palladium, iridium, rhodium, osmium, ruthenium and copper associated with a particulate solid other than said particulate nonzeolitic catalyst, said particulate being physically admixed with said catalyst;

(b) introducing sufficient molecular oxygen into said regeneration zone to provide an atmosphere therein having a molecular oxygen concentration of at least 0.5 volume percent;

(c) removing sufficient coke from said nonzeolitic catalyst in said regeneration zone to provide an average carbon content of less than 0.2 weight percent in catalyst passed from said regeneration zone to said cracking zone;

(d) including in said particulate catalyst a substantially silica-free alumina phase, said alumina phase including about 50 to 5000 parts per million of reactive alumina, said particulate catalyst being substantially free from said metal or compound of said metal;

(e) forming a sulfur- and aluminum-containing solid in said particulate nonzeolitic catalyst in said regeneration zone by reacting sulfur trioxide with alumina present in said alumina phase in said catalyst;

(f) removing sulfur from said particulate nonzeolitic catalyst and forming hydrogen sulfide in said cracking zone by contacting said sulfur- and aluminum-containing solid with said hydrocarbon stream.

4,204,946

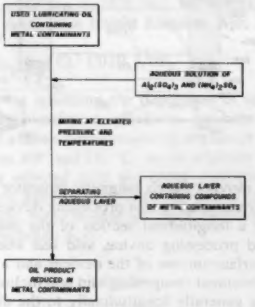
PROCESS FOR REMOVING METAL CONTAMINANTS FROM USED LUBRICATING OILS

Conrad B. Johnson, Edmonton, Canada, assignor to Turbo Resources Ltd., Edmonton, Canada

Filed Feb. 12, 1979, Ser. No. 11,093

Int. Cl.[2] C10M *11/00*

U.S. Cl. 208—181 **7 Claims**


USED LUBRICATING OIL CONTAINING METAL CONTAMINANTS
AQUEOUS SOLUTION OF $Al_2(SO_4)_3$ AND $(NH_4)_2SO_4$
MIXING AT ELEVATED PRESSURE AND TEMPERATURES
SEPARATING AQUEOUS LAYER
AQUEOUS LAYER CONTAINING COMPOUNDS OF METAL CONTAMINANTS
OIL PRODUCT REDUCED IN METAL CONTAMINANTS

1. A process for removing metal contaminants from used lubricating oil comprising:

contacting the lubricating oil with an aqueous solution of ammonium sulphate and aluminum sulphate in a closed vessel at elevated temperatue to form compounds of the metal contaminants separable from the oil in an aqueous phase; and

separating said aqueous phase from the lubricating oil to provide an oil product reduced in metal contaminants.

4,204,947

PROCESS FOR THE REMOVAL OF THIOLS FROM HYDROCARBON OILS

Robert L. Jacobson, Hercules, and Kirk R. Gibson, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 892,544, Apr. 3, 1978, Pat. No. 4,163,708. This application Jun. 12, 1978, Ser. No. 915,022
The portion of the term of this patent subsequent to Jul. 24, 1996, has been disclaimed.
Int. Cl.[2] C10G *29/16, 29/06, 29/04*
U.S. Cl. 208—243 13 Claims

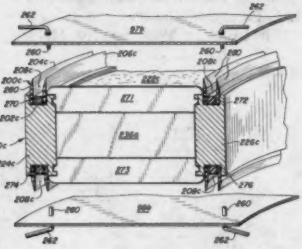
1. A process for absorbing thiol impurity from a hydrocarbon oil boiling in the range from about 10° C. to 300° C. and having a total sulfur-containing-impurity content, calculated as elemental sulfur, below 1000 ppm, including at least 0.4 ppm of thiol impurity, which comprises contacting said oil in the substantial absence of molecular oxygen with a scavenger at a temperature in the range 120° to 400° C., said scavenger comprising an essentially oil insoluble solid composite having a copper component and an inorganic porous carrier component, and having a surface area in the range from about 20 to 1000 square meters per gram, said copper component being copper metal, a copper compound or a mixture thereof, said carrier being a porous inorganic refractory metal oxide or a mixture of such oxides or carbon, and said contacting being continued until the resulting oil product from said contacting has a thiol content below about 0.3 ppm.

4,204,948

SELF-PURGING SEAL

Ionel Wechsler, Framingham; John A. Oberteuffer, Lexington; John J. Nolan, W. Wareham; Henry H. Kolm, Wayland; Eric Georgelis, Hyde Park, and Bo R. Arvidson, Acton, all of Mass., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 18, 1978, Ser. No. 970,245
Int. Cl.[2] B03C *1/02*
U.S. Cl. 209—223 R 12 Claims



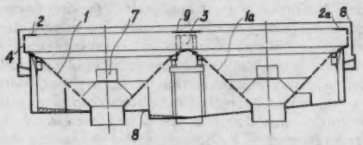
1. In a moving matrix magnetic separator in which a matrix device moves relative to a processing device and a seal assembly seals a longitudinal section of the matrix device to an associated processing device, said seal assembly including a sealing surface on one of the devices and a seal on the other, the improvement comprising said seal including a base portion extending generally longitudinally to the direction of motion of the matrix device and having an inflatable passage extending longitudinally therethrough, first and second salient, resilient lip portions extending from said base portion toward an associated sealing surface in the gap between the matrix device and processing device, and means for inflating and deflating said passage to control the contact pressure between said lip portions and said associated sealing surface, said lip portions extending generally longitudinally to the direction of motion of the matrix device and spaced from each other transversely to the direction of motion of said matrix device and forming a channel therebetween; a pressurized purge fluid chamber formed by said channel and the associated sealing surface; and means for suppling purging fluid to the purge fluid chamber formed by said channel and lip portions with the associated sealing surface.

4,204,949

DEVICE FOR WET CLASSIFICATION OF A MIXTURE OF SOLID COMPONENTS ACCORDING TO SIZE

Antoni Jedo, Gliwice, and Waclaw Jachna, Tychy, both of Poland, assignors to Centralny Osrodek Projektowo-Konstrukcyjny Maszyn Gorniczych KOMAG, Gliwice, Poland

Filed Dec. 8, 1978, Ser. No. 967,733
Int. Cl.[2] B07B *1/06*
U.S. Cl. 209—250 5 Claims



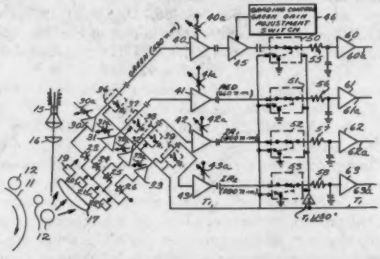
1. A device for wet classification of solid particles by size, comprising: at least two curvilinear conic sieve planes formed of segments, two horizontal circular chutes situated tangentially and adjacently at an upper level of said sieve planes, a common feeding nozzle tangential to and between said circular chutes, a dividing wedge facing said common feeding nozzle, a distributing hole holding said dividing edge, a vibratory unit located on a central vertical axis of each of said sieve planes, said circular chute being horizontal and lying above the edge of said sieve planes, said solid particles flowing along said sieve planes in a downward direction, part of liquid used in wet classification returning near said common feeding nozzle and being reused, said dividing wedge being swivel-mounted for dividing flow equally.

4,204,950

PRODUCE GRADING SYSTEM USING TWO VISIBLE AND TWO INVISIBLE COLORS

Henry H. T. Burford, Jr., Springfield, Va., assignor to Sortex North America, Inc., Lowell, Mich.

Filed Feb. 8, 1978, Ser. No. 876,085
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—558 15 Claims



1. A method for sorting articles of a given produce according to a desired red color of that produce and for sorting undesired nonvegetable articles such as dirt clods and rocks from desired produce to be retained, comprising

passing through an inspection position the given articles of produce to be sorted along with mingled dirt clods and rocks,

illuminating the inspection position with light that includes a narrow band of visible green light substantially centered at approximately 530 nm, a narrow band of visible red

light substantially centered at approximately 660 nm, and first and second narrow bands of invisible light respectively centered at approximately 800 nm and 990 nm,

receiving light reflected from articles passing through the inspection position,

producing first, second, third and fourth signals corresponding, respectively, to the amount of light that exceeds predetermined amounts of light in said 530, 660, 800 and 990 nm bands,

detecting the presence of an article at the inspection position,

comparing the first and second signals to determine if an acceptable amount of red color is present in detected articles, including whitish-green articles

comparing the second and third signals to determine if an acceptable amount of red color is present in detected articles, including dark green articles,

comparing the third and fourth signals to determine if a detected object is vegetable or nonvegetable matter.

4,204,951

APPARATUS FOR SORTING CAPSULES AND THE LIKE

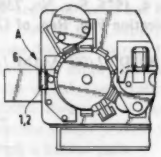
Theo Moser, Remseck; Andrä Rolf; Roland Rittler, both of Fellbach, and Armin Strampfer, Hegnach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 905,075

Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722499

Int. Cl.² B07C *5/06*

U.S. Cl. 209—625 **5 Claims**



1. An apparatus for sorting capsules, comprising:

a first member having a plurality of cylindrical apertures therein for receiving capsules, said capsules including intact capsules having a top part and a bottom part and having been filled with powdery contents and also including defective capsules, lacking at least the top part or being deformed;

a second member disposed in juxtaposition to and movable with respect to said first member and also having a plurality of cylindrical apertures;

means for permitting said first and second members to assume a first relative position in which the cylindrical apertures of both members are axially aligned permitting movement of intact capsules into the cylindrical apertures of said second member and a second relative position in which the cylindrical apertures of said first and second members are relatively displaced; and

suction means, for applying suction to the capsules in said first and second members, said suction means being adapted to urge intact capsules to be transferred from said first member to said second member and aspirate and remove the powdered contents of any capsule lacking a top part.

4,204,952

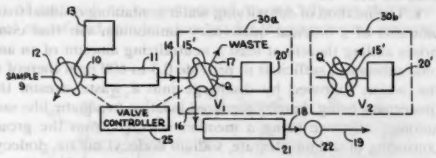
CHROMATOGRAPHIC APPARATUS AND METHOD

Lloyd R. Snyder, Yorktown Heights, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jul. 7, 1978, Ser. No. 922,712

Int. Cl.² B01D *15/08*

U.S. Cl. 210—31 C **5 Claims**



1. A method of increasing the throughput of a chromatographic system, which system is continuously operated and fed a series of samples, each sample containing a particular constituent of interest, said method comprising the steps of:

(a) periodically passing a series of samples at a first controlled rate into a first chromatographic column for the purpose of separating a particular constituent of interest from each of said samples;

(b) obtaining eluant materials for each sample passing from said first chromatographic column and retaining in said chromatographic system only that fraction of each sample containing said particular constituent of interest; and

(c) periodically passing the retained fraction of each sample into a second chromatographic column at a second controlled rate, said first rate being in substantial synchronism with said second rate such that there is sufficient separation between the particular constituent of interest of each of said fractions leaving said second column to provide an improved throughput of the chromatographic system, because a fraction of a number of samples will be concurrently passing through said second chromatographic column.

4,204,953

PROCESS FOR ALKALINE SCALING

Thomas D. Hodgson, Abingdon; Kenneth W. Carley-Macauly, Stanford in the Vale, and Sidney Smith, Alderley Edge, all of England, assignors to Ciba-Geigy Limited, London, England

Continuation of Ser. No. 570,371, Apr. 22, 1975, abandoned.

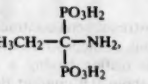
This application Sep. 6, 1978, Ser. No. 940,132

Claims priority, application United Kingdom, Apr. 30, 1974, 18980/74

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **2 Claims**

1. In a method for inhibiting the deposition of scale from saline water having bicarbonate alkalinity, onto the heat exchange surfaces of a saline water evaporation plant at temperatures between about 104° and 120° C., by the addition of a scale inhibiting additive selected from the group consisting of hydrolyzed polymaleic anhydride, polyacrylic acid, a terpolymer of maleic anhydride, vinyl acetate and ethyl acrylate, aminotrismethylene phosphonic acid,



and polymethacrylic acid, said additive being employed in an amount of from 0.5 to 6 ppm of water to be treated, the improvement which comprises adding a mineral acid to the saline water to neutralize 50–75% of the bicarbonate alkalinity thereof, the amount of acid being such that the pH of the saline water which is flowing within the plant is not reduced below 7.5.

4,204,954

DETOXIFICATION OF RESIDUAL QUATERNARIES

Jose T. Jacob, Lake Zurich, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Continuation of Ser. No. 929,981, Aug. 1, 1978, abandoned. This application Jun. 8, 1979, Ser. No. 47,186

Int. Cl.[2] C02C *5/02*

U.S. Cl. 210—59 4 Claims

1. The method of detoxifying water containing residual toxic amounts of a biocidal quaternary ammonium salt that comprises adding thereto at least a neutralizing amount of an anionic substance, sufficient to provide 0.3 to 600 ppm thereof in the water, followed by discharge into a waste stream, the quaternary being thereby rendered inactive to aquatic life; said anionic substance being a member selected from the group consisting of sodium stearate, sodium dodecyl sulfate, dodecyl glycine, dodecyl amino ethyl glycine, sodium palmitate, sodium oleate, sodium linoleate, or sodium dioctyl sulfosuccinate.

4,204,955

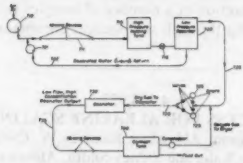
SYSTEM FOR POLLUTION SUPPRESSION

Edward T. Armstrong, 490 Pepperidge Tree Ter., Smoke Rise, Butler, N.J. 07405

Continuation of Ser. No. 616,486, Sep. 24, 1975, abandoned, which is a division of Ser. No. 531,095, Dec. 9, 1974, Pat. No. 3,998,714, which is a continuation-in-part of Ser. No. 355,738, Apr. 30, 1973, Pat. No. 3,853,764, which is a continuation-in-part of Ser. No. 100,333, Dec. 21, 1970, Pat. No. 3,730,881, which is a continuation-in-part of Ser. No. 813,382, Feb. 28, 1969, Pat. No. 3,549,528, which is a continuation-in-part of Ser. No. 362,118, Apr. 23, 1964, abandoned. This application Apr. 25, 1978, Ser. No. 898,484

Int. Cl.[2] C02C *5/04*

U.S. Cl. 210—61 18 Claims



1. A process for producing, injecting, and dispersing an ozonated oxygen containing gas into a fluid, comprising the steps of:

adding a feed gas selected from the class consisting of air, oxygen-enriched air, and oxygen, to an ozone generator at a reduced feed gas flow rate compared to an ozonator feed gas rate corresponding to a maximum ozone production rate, said reduced feed gas flow rate being associated with reduced efficiency of ozone production as measured by the criteria of pounds of ozone produced per kilowatt hour of ozonator energy expended, the concentration of produced ozone in said feed gas being relatively increased to levels greater than the concentration typical of either said ozone production at maximum rates or at maximum ozone production rate per unit of ozonator energy expended;

creating a downstream vena contracta portion by a constriction in a conduit, said constriction being a flat plate orifice, said flat plate orifice having a diameter ranging from about 0.7 to about 0.9 conduit diameters, said flat plate orifice also creating said vena contracta portion from about 0.25 to about 0.5 conduit diameters downstream from said orifice;

injecting said ozonated feed gas into said conduit in said vena contracta portion; and

injecting said ozonated feed gas at a flow rate such that the concentration of said ozone in said fluid is at least 0.5 parts per million.

4,204,956

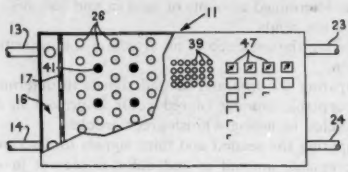
WATER PURIFICATION SYSTEM

Robert E. Flatow, 2010 Farallon Dr., San Leandro, Calif. 94577

Filed Oct. 2, 1978, Ser. No. 947,619

Int. Cl.[2] C02B *3/08*

U.S. Cl. 210—87 12 Claims



1. A water purification system comprising

a tank having a plurality of parallel high intensity ultra-violet lamps disposed laterally across the tank in evenly spaced array with the lamps thereof disposed in close proximity without ultra-violet attenuators therebetween,

water inlet means including an apertured diffusion plate directing water uniformly through said tank laterally across said lamps for irradiation of said water with high intensity ultra-violet rays, and

sensing means disposed in spaced relation uniformly throughout said lamp array in said tank for indicating the intensity of ultra-violet radiation as received by water passing through said tank.

4,204,957

ARTIFICIAL KIDNEY

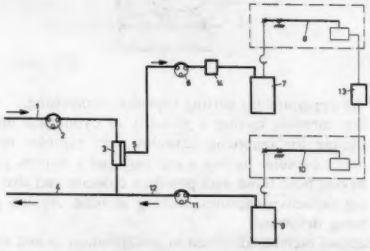
Ludwig Weickhardt, Bovenden, Fed. Rep. of Germany, assignor to Sartorius Membranfilter GmbH, Gottingen, Fed. Rep. of Germany

Filed Nov. 4, 1976, Ser. No. 738,905

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552304

Int. Cl.[2] B01D *31/00*; A61M *1/03*

U.S. Cl. 210—98 7 Claims



1. An artificial kidney comprising a filter disposed between an artery connection and a vein connection, a collecting means for the filtrate to be discharged from said filter, a means for providing a metered supply of substituate to the purified blood, and a measuring means including two weighing devices, a first weighing device measuring the weight of the filtrate to be discharged, and a second weighing device measuring the weight of the substituate, said measuring means further including a means for forming a quotient of the weight recorded by the first weighing device and that recorded by the second weighing device, and a comparison means for comparing said quotient with at least one desired value, said measuring means controlling said providing means in dependence on the result of the comparison whereby the metered supply of substituate is in a fixed weight proportionability to the filtrate weight.

4,204,958

METHOD AND APPARATUS FOR TREATMENT OF SLUDGE

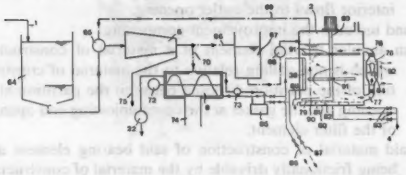
Joseph Richard Kaelin, Buochs, Switzerland, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 740,884, Nov. 11, 1976, abandoned. This application Jul. 27, 1978, Ser. No. 928,427

Claims priority, application Switzerland, Nov. 12, 1975, 14705/75; Dec. 31, 1975, 16932/75; Feb. 19, 1976, 2022/76; Oct. 25, 1976, 13471/76

Int. Cl.[2] C02C 3/00

U.S. Cl. 210—178 7 Claims



1. Apparatus for continuous treatment of wet sludge from a sewage treatment plant comprising:

(a) dewatering means with an inlet for supplying wet sludge thereto and an outlet for discharge of dewatered sludge therefrom, said dewatering means reducing the wet sludge to a maximum water content of 90%;

(b) a heat insulated wet sludge aeration vessel, said vessel being provided with an inlet, an outlet, and circulation means for circulating the dewatered sludge in the interior of the vessel and with aeration means for concurrently aerating the sludge with an oxygen-containing gas to develop temperatures of from 40° C. to 80° C. in the sludge by a thermophilic digestion biological conversion process, said circulationg means being located outside of the wet sludge aeration vessel and being fluidly connected to the interior thereof by a supply duct and a discharge duct with means disposed therein to render them capable of being shut off; the supply duct and the discharge duct opening into the wet sludge aeration vessel in an approximately tangential direction at points vertically spaced apart such that the sludge present in the aeration vessel is circulated along a helical path;

(c) conduit means connecting the outlet of the dewatering means with the inlet of said heat insulated wet sludge aeration vessel for transfer of dewatered sludge from the dewatering means to said wet sludge aeration vessel;

(d) a heat exchanger in heat exchange contact with the sludge circulating inside the vessel, and said inlet of said dewatering means being connected by conduit means to the outlet of the heat insulated wet sludge aeration vessel to reduce the sludge to a water content of from about 50% to about 80%; and

(e) means for discharging finally dewatered sludge from said dewatering means.

4,204,959

APPARATUS FOR THE TREATMENT AND COMPOSTING OF BIOLOGICAL WASTE

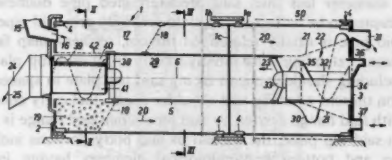
Eberhard Kreuzburg, Ratzeburg; Günter Eichholz, and Knut Dederichs, both of Mölln, all of Fed. Rep. of Germany, assignors to Gesellschaft zur Errichtung von Unweltschutzanlagen mbH, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,159

Int. Cl.[2] C02C 1/14, 1/40

U.S. Cl. 210—195.1 19 Claims

1. Apparatus for the biological composting of waste material comprising a first thermally insulated hollow cylinder mounted for rotation about its longitudinal axis; a second hollow cylinder mounted within said first cylinder for for conjoint rotation therewith; means for closing the ends of said first and second cylinders to define a first annular chamber therebetween and a second chamber within said second cylinder, inlet means communicating with said annular chamber adjacent one axial end thereof for the introduction into said annular chamber of materials to be composted, means adjacent the other axial end of said annular chamber for the transferring material



from said annular chamber to said second chamber within said second cylinder; discharge means communicating with the chamber within said second cylinders, whereby said waste material is moved in a path through said annular chamber from said one axial end to said other axial end thereof and countercurrently through the interior of said second cyliner, the heat generated during biological decay of the material during its movement in said annual chamber being employed to heat the material in said second chamber.

4,204,960

COMBINATION STRAINER AND SUCTION INLET PIPE

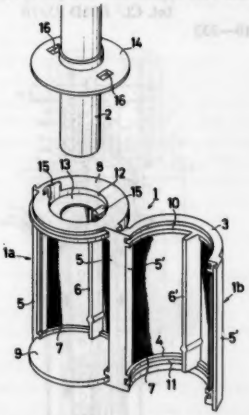
Masaaki Sugiyama, Fuji, and Takuo Yuda, Yokohama, both of Japan, assignors to Yamakawa Industry Company Ltd. and Nifco Inc., both of, Japan

Continuation of Ser. No. 847,973, Nov. 2, 1977, abandoned, which is a continuation of Ser. No. 689,705, May 24, 1976, abandoned. This application Aug. 31, 1978, Ser. No. 938,565

Claims priority, application Japan, May 26, 1975, 50-69689

Int. Cl.[2] B01D 35/02, 35/08

U.S. Cl. 210—232 4 Claims



1. A one-piece strainer in combination with a metallic suction pipe of predetermined diameter having an open free end and having a metallic flange at a predetermined length from said free end, said strainer including two mating generally symmetrical semi-cylindrical body portions, one of said body portions terminating with an integral annular top plate having a centrally disposed through hole therein greater in size than

said predetermined pipe diameter, said one body portion also having an integral imperforate bottom plate spaced from said top plate a distance greater than said predetermined length of said pipe from said flange to said free end, said one body portion further including circumferentially spaced substantially rigid column means maintaining said plates in spaced relationship, an integral injection molded resilient thin seal member having a substantially uniform thickness and extending radially inwardly from the margins of said top plate central through hole, said resilient thin seal member having a central co-axially disposed aperture defining a flexible thin inner margin having a diameter less than said predetermined pipe diameter and adapted to be deflected axially to sealingly grip said pipe when said pipe is axially telescoped therein, resilient snap fastener means extending substantially axially from said top plate and including shoulder means facing said top plate in spaced relation thereto whereby said shoulder means lockingly cooperate with said flange carried by said pipe when said flange is seated on said top plate, the second of said body portions including top and bottom semi-cylindrical elements having internal grooves for mating with said top and bottom plates, said elements maintained in spaced relation by circumferentially spaced substantially rigid column members, hinge means joining one of said column members disposed at an edge of said one body portion throughout a substantial portion of its length to one of said column members disposed at an edge of said second body portions, filtration net means embedded in and extending axially between said top and bottom plates and axially between said semi-cylindrical top and bottom elements and embedded at spaced points in said column members and said hinge, and locking means carried by said body portions for forming a cylindrical closed strainer chamber when said body portions are moved into locking matched relation by movement about said hinge, whereby said body portions are locked in closed sealing relation except for the aperture in the sealing member which accepts the pipe in sealed relation and the net for filtration purposes.

4,204,961

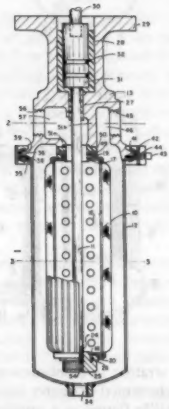
FILTER APPARATUS WITH CLEANING FUNCTION

John Cusato, Jr., 1902 Surrey Rd., Oreland, Pa. 19075

Continuation-in-part of Ser. No. 886,680, Mar. 15, 1978, abandoned. This application Jan. 31, 1979, Ser. No. 7,965

Int. Cl.[2] B01D *35/16*

U.S. Cl. 210—232 **7 Claims**



1. A fluid filter apparatus which comprises:

a housing forming an enclosed space and having an inlet opening and an outlet opening,

a filter element in said enclosed space of hollow cylindrical form with an opening at its opposite ends,

a gasket presenting a friction surface around the openings at both ends of the filter element,

a shaft rotatably mounted in the housing and passing therethrough and located at the axis of the filter,

connecting means between the shaft and the filter element to rotate the filter and spin off dirt collected thereon,

and a partition within the housing separating the inlet and outlet openings and directing fluid from the inlet opening to the exterior of the filter element, said partition having an opening therethrough which communicates with an end opening of the filter element so fluid from the hollow interior flows to the outlet opening,

and includes the improvement comprising:

an annular bearing element of a material of construction which is non-galling relative to the material of construction of the partition disposed between the partition at its opening and the gasket at the communicating end opening of the filter element,

said material of construction of said bearing element also being frictionally drivable by the material of construction of said gasket when the shaft is rotated and frictionlessly bearing on the partition to form a relatively free slippage area between them.

4,204,962

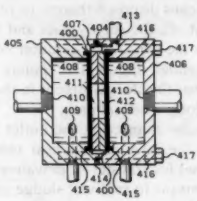
CONTINUOUS ANALYSIS OF BEVERAGES

Gregory A. Ford, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 3, 1978, Ser. No. 883,015

Int. Cl.[2] B01D *75/24*

U.S. Cl. 210—316 **11 Claims**



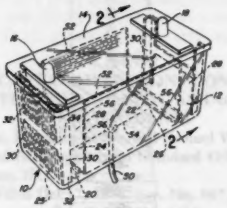
1. A bypass filter comprising first and second filter means separated by a filter spacer and secured between first and second filter body halves in a filtrate receiving cavity defined by adjoining portions of said first and second filter body halves; wherein said first and second filter body halves each contain a sample receiving cavity therein open to a substantial amount of the adjoining surface of the adjoining filter means, an inlet port communicating with said filter body half sample receiving cavity in such a manner that when liquid is passed into said port it will flow around the periphery of said sample receiving cavity in swirling motion, and a retentate outlet port allowing liquid to flow out of said sample receiving cavity without flowing through the adjoining filter means; wherein said filter spacer contains a cavity therein providing communication between said first and second filter means; wherein said filter spacer further contains an outlet providing for communication between said filter spacer cavity and said filtrate receiving cavity; and wherein there is a filtrate outlet port in communication with said filtrate receiving cavity to allow filtrate to flow out of said bypass filter.

4,204,963

SEALING MEMBERS FOR A MEMBRANE DIFFUSION DEVICE

Daniel F. Bischof, McHenry, and John M. Munsch, Libertyville, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 20, 1978, Ser. No. 926,466
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **7 Claims**



1. A membrane diffusion device which comprises a stack of membrane wall pairs and membrane supports in alternating, interleaving relation, the stack being disposed in a casing and defining opposed ends, the casing inner walls defining a draft angle, the improvement comprising:

rigid shim member means spaced at the outer corners of said stack between said stack and the inner walls of the casing, said rigid shim member means being tapered and proportioned to compress the end portions of said stack between said inner walls of the casing and said shim member means to a degree which is generally equal across the entire length of said rigid shim member means, the rigid, tapered shim member means at respective ends of the stack being connected together by a cross bar member to form an integral unit.

6. A membrane diffusion device which comprises a stack of membrane wall pairs and membrane supports in alternating, interleaving relation, said stack being disposed in a casing having a lid, and an inflatable member positioned adjacent said stack, said inflatable member comprising a double-folded, flexible member defining a central seal line spaced from the edges of the flexible member except at the ends thereof, and defining two opposed, folded ends which are free of seal lines, said ends being positioned closely adjacent the casing and between said stack and casing adjacent said lid whereby, upon inflation, the degree of withdrawal of said seal lines is less compared with inflatable members which carry a seal line.

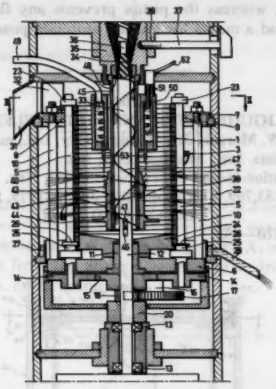
4,204,964

CONTINUOUS CENTRIFUGAL FILTER FOR VARIOUS FILTERING AND AUTOMATIC COFFEE MAKING

Serge Cailliot, Neuilly-sur-Seine, France, assignor to Societe Normande de Services, Boulogne; Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine; Societe Generale pour le Financement de l'Innovation, Soginnove, Paris; Bertrand Cor, Paris and Arnaud Gastinne, Paris, all of, France, part interest to each

Filed Jun. 1, 1978, Ser. No. 911,696
Claims priority, application France, Jun. 2, 1977, 77 16927
Int. Cl.² B01D *33/14*
U.S. Cl. 210—370 **13 Claims**

1. A centrifugal separator comprising a support assembly comprising plural guide rods, endless band means on said support assembly, said endless band means being sufficiently stiff to provide means for positioning a helically wound wall portion entirely within said guide rods, a such helically wound wall portion defining a separator, and a return portion mounted around said rods and extending along a generally helical path between the ends of said helically wound wall portion, said guide rods being rotatably mounted on said support assembly and circumferentially spaced around and engaging said helically wound wall portion of said band, combined drive means for driving the entire support assembly in rotation about the central axis of said assembly and for simultaneously driving at least one of said plural guide rods so as to revolve said helical wall portion relative to said support and provide movement of said band relative to said support along said



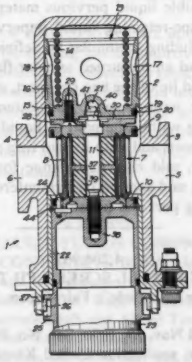
helical path, generally about the central axis of said assembly to thereby cause continuous unwinding of the band from one end of the helical wall portion and rewinding of the band at the other end of the helical wall portion, said combined drive means being designed so that said rotation is substantially faster than said movement of said band along said helical path.

4,204,965

SAFETY DEVICE FOR OIL FILTERS AND THE LIKE

Rene J. Vincent, Oupeye, Belgium, assignor to Fabrique Nationale Herstal, en abrégé FN, societe anonyme, Herstal, Belgium

Filed Mar. 5, 1979, Ser. No. 17,559
Claims priority, application Belgium, May 9, 1978, 56947
Int. Cl.² B01D *35/12*
U.S. Cl. 210—447 **7 Claims**



1. Safety device for oil filters and the like, of the type which consists of a casing fitted in a fluid circuit and provided to receive a filtering cartridge therein, such a casing having a bottom which is opposite to an access opening which can be closed by a cover and which is intended to receive a filtering cartridge which can be entered and removed through aforesaid opening, characterized by the fact that it mainly consists of a

piston which is entered with frictional fit in aforesaid casing and is intended to be thrust down towards the bottom of the latter in a waiting position, subsequent to the insertion of the cartridge, at least one passage provided through aforesaid piston; a means for bringing the piston to its active position on removal of the cartridge from the casing, position in which aforesaid passage assures the continuity of flow through aforesaid line, whereas the piston prevents any flow out of the casing, and a means for locking aforesaid piston in its active position.

4,204,966

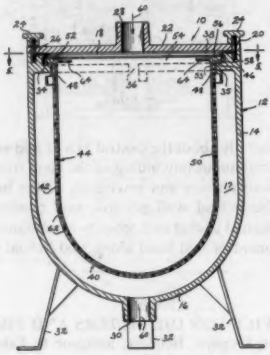
LIQUID FILTER AND FILTER ELEMENT

Howard W. Morgan, Jr., Michigan City, Ind., assignor to Filter Specialists, Inc., Michigan City, Ind.

Continuation-in-part of Ser. No. 854,482, Nov. 25, 1977, Pat. No. 4,133,769. This application Jan. 2, 1979, Ser. No. 174

Int. Cl.[2] B01D *29/30*

U.S. Cl. 210—455 **7 Claims**



1. In a liquid filter including a housing having a side wall defining a chamber therein, said chamber having an opening, an annular support carried by said housing and defining at least in part said chamber opening, an inlet port and an outlet port, the improvement comprising a filter bag having a wall part formed of a flexible liquid pervious material and a ring part formed of a shape-retaining liquid impervious material, said bag ring part including an annular lip defining the opening into said filter bag and an outturned annular flange, said bag wall part joined to said lip of the bag ring part, said filter bag fitting in said chamber with its wall part extending through said chamber opening within the path of liquid flow between said inlet and outlet ports and with its said ring part flange contacting said support, said ring part flange forming (at all times when contacting said support) a circumferential hermetic seal between said ring part and housing.

4,204,967

TUBEWELL SCREEN FILTERS

Alan S. Bannister, "Brelade", Fair Green, Diss, Norfolk, England

Filed Nov. 29, 1978, Ser. No. 964,696

Claims priority, application United Kingdom, Dec. 2, 1977, 50327/77

Int. Cl.[2] B01D *35/02*

U.S. Cl. 210—459 **14 Claims**

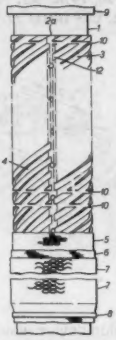
1. A tubewell screen filter comprising

means defining a passage for filtered water having apertures to allow filtered water to enter the passage, and

a filter assembly mounted on and surrounding the passage-defining means, said assembly comprising

support means defining channels leading to the apertures, said support means including

a coarse mesh material contiguous with and supported by another part of the support means, and the assembly further comprising



a fine mesh screen means contiguous with the coarse mesh material and having an open area of at least 12% of its overall area.

4,204,968

LUBRICANT ADDITIVE

Jack E. Mack, and Patrick K. Mack, both of Littleton, Colo., assignors to CLM International Corp., Englewood, Colo.

Filed Aug. 11, 1978, Ser. No. 932,863

Int. Cl.[2] C10M *1/54, 3/48*

U.S. Cl. 252—26 **17 Claims**

1. A lubricant additive composition comprising a lubricating liquid carrier containing an effective amount of a mixture of powdered copper and lead metal particles of spherical configuration not more than 20 microns in diameter.

4,204,969

LUBRICANT COMPOSITION CONTAINING SULFURIZED OLEFIN EXTREME PRESSURE ADDITIVE

Andrew G. Papay, Manchester, and Joseph P. O'Brien, Kirkwood, both of Mo., assignors to Edwin Cooper, Inc., St. Louis, Mo.

Filed Oct. 10, 1978, Ser. No. 950,022

Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—45 **11 Claims**

1. A sulfurized lubricating oil additive which imparts improved extreme pressure properties made by the process consisting essentially of (a) reacting S_2Cl_2 with a C_{3-6} aliphatic monoolefin at about 30°–100° C. to produce an adduct, (b) reacting said adduct with sulfur and Na_2S in an aqueous alkanol medium at a temperature of about 50° C. up to reflux using about 0.1–0.4 gm atom of sulfur per gm mole of Na_2S and then

(c) recovering said additive without heating with aqueous caustic.

11. A lubricating oil composition containing an extreme pressure improving amount of a sulfurized oil additive of claim **1**.

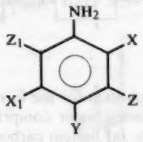
4,204,970

LUBRICANT COMPOSITIONS CONTAINING ALKYLATED AROMATIC AMINO ACID ANTIOXIDANTS

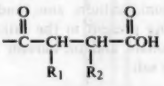
Richard J. Lee, Downers Grove, and Samuel W. Harris, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 7, 1978, Ser. No. 967,295
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A **10 Claims**

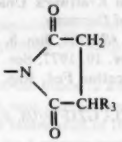
1. A lubricant composition resistant to oxidative deterioration comprising a major proportion of hydrocarbon oil and about 0.1% to 10% of an amino acid having the structure:



wherein X has the structure



one of R_1 and R_2 is hydrogen and the other is a residue of an olefin polymer; X_1 is selected from the group consisting of X and hydrogen; when X_1 is X, Y is NH_2; when X_1 is hydrogen, Y is selected from the group consisting of hydrogen, alkyl, aryl, halogen, nitro, amino, and



and R_3 is an olefin polymer residue; Z and Z_1 are separately selected from the group consisting of hydrogen, alkyl, halogen, nitro, amino, and fused benzene.

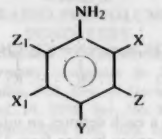
3. A process for the production of an alkylated aromatic amino acid which comprises

(a) reacting an aromatic amine with an anhydride of an alpha, beta dicarboxylic acid with an aliphatic chain in the alpha or beta position to generate a substituted imide

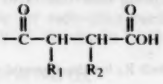
(b) intramolecularly acylating the imide of step (a) by a Lewis acid catalyst to generate a substituted cyclic keto amide

(c) hydrolyzing the cyclic keto amide of step (b) in base to generate the substituted aromatic amino acid.

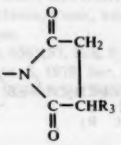
10. An amino acid having the structure



wherein X has the structure



one of R_1 and R_2 is hydrogen and the other is a residue of an olefin polymer; X_1 is selected from the group consisting of X and hydrogen; when X_1 is X, Y is NH_2; when X_1 is hydrogen, Y is selected from the group consisting of hydrogen, alkyl, aryl, halogen, nitro, amino, and



and R_3 is an olefin polymer residue; Z and Z_1 are separately selected from the group consisting of hydrogen, alkyl, halogen, nitro, amino, and fused benzene.

4,204,971

CALCIUM OXIDE OR HYDROXIDE TO IMPROVE THE CHARGE ACCEPTANCE OF ELECTROGRAPHIC DIELECTRIC RESINS

Gerson E. Beauchamp, Parkridge, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 819,849, Jul. 28, 1977, Pat. No. 4,145,478. This application Oct. 25, 1978, Ser. No. 954,664
Int. Cl.[2] G03G *5/022*; H01B *3/42, 3/44*
U.S. Cl. 252—63.5 **12 Claims**

1. A resin solution adapted to deposit, upon drying, an electrographic dielectric coating having improved charge accepting capacity comprising, in volatile organic solvent solution, an organic solvent-soluble thermoplastic insulating resin having carboxyl functionality providing an acid value of from 5–100, and calcium oxide or calcium hydroxide dispersed in the resin solution in an amount of from 0.05–3% of the weight of the carboxyl-functional resin.

4,204,972

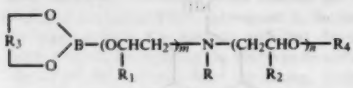
HYDRAULIC FLUIDS COMPRISING NITROGEN-CONTAINING BORIC ACID ESTERS

Wolfgang Knoblauch, Burghausen, and Konrad von Werner, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft and Alfred Teves, both of Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 30, 1979, Ser. No. 7,723
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804535
Int. Cl.[2] C10M *3/48, 3/26*
U.S. Cl. 252—78.1 **4 Claims**

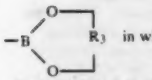
1. Hydraulic fluid essentially consisting of

(A) about 10 to about 60% by weight of at least one nitrogen-containing boric acid ester of the following formulae I to III



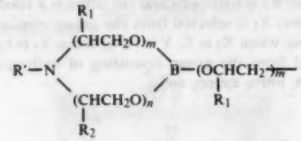
(I)

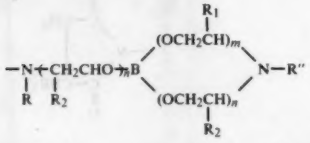
in which m and n each denotes an integer from 1 to 3, R denotes an alkyl group having from 1 to 9 carbon atoms, R_1 and R_2 denote hydrogen or methyl, R_3 denotes —CH-2—CH_2— or —$CH_2CH_2OCH_2CH_2$— and R_4 denotes hydrogen or a radical of the formula



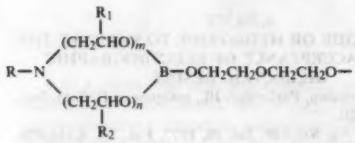
(II),

in which R_3 has the aforesaid meaning;

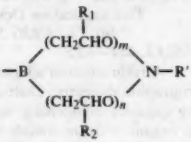




in which m, n, R, R_1 and R_2 have the aforesaid meaning and R′ and R″ each has one of the meanings of R;

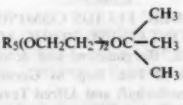


(III),



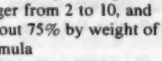
in which m, n, R, R′, R_1 and R_2 have the aforesaid meaning;

(B) about 5 to about 30% by weight of an alkyl polyethylene glycol tert.butyl ether of the formula



in which R_5 denotes alkyl having from 1 to 4 carbon atoms and z is an integer from 2 to 10, and

(C) about 35 to about 75% by weight of a glycol monoalkyl ether of the formula



in which x denotes an integer from 2 to 5, R_6 denotes alkyl having from 1 to 4 carbon atoms and R_7 denotes hydrogen or methyl.

4,204,973

TREATMENT COMPOSITION FOR USE IN CHROME REMOVAL AND RECOVERY

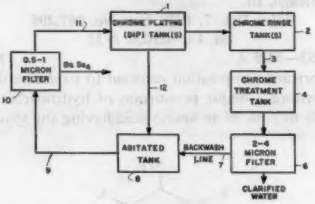
Edward J. Feltz, Dayton, and Ross Cunningham, Mt. Gilead, both of Ohio, assignors to John Cunningham, Portsmouth, Ohio

Division of Ser. No. 657,885, Feb. 13, 1976, Pat. No. 4,054,517, which is a continuation-in-part of Ser. No. 500,606, Aug. 6, 1974, Pat. No. 3,969,246. This application Aug. 29, 1977, Ser. No. 828,345

The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.

Int. Cl.[2] C02C 5/02

U.S. Cl. 252—181 **3 Claims**



1. A treatment composition for use in removing chromium from chromium-containing water comprising a dry powder mixture of components: (a) barium carbonate and/or barium hydrate and (b) a water-soluble acetate salt selected from the group consisting of the acetates of barium, calcium, strontium, iron, aluminum, tin, cerium, cobalt, copper, magnesium, manganese, nickel, uranium, sodium, zinc, and mixtures thereof, said components being present in the ratio of 3–15 parts by weight barium carbonate and/or barium hydrate to 1 part water-soluble acetate salt.

4,204,974

METHOD FOR REMOVING RADIOACTIVE PLASTIC WASTES AND APPARATUS THEREFOR

Anwer Puthawala; Lutz Hoffmann; Hermann Emmert, all of Erlangen; Werner Hild, Hochstetten; Hans-Erich John, and Wolfgang Kluger, both of Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Müilheim, Fed. Rep. of Germany

Continuation of Ser. No. 693,782, Jun. 8, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,369

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1975, 2531584

Int. Cl.[2] G21F 9/08, 9/34

U.S. Cl. 252—301.1 W **4 Claims**

1. In a method for removing radioactive plastic wastes, consisting essentially of radioactively contaminated ion exchange filter material admixed with water, by drying and encapsulating in bituminous solidification substances and pouring into a container, the improvement which comprises subjecting the previously untreated radioactive waste separate and apart from siad bituminous substance to drying at temperatures of 60° to 80° C. to produce a flowably dry radioactive waste without decomposition of the waste, introducing regulated amounts of said dry radioactive waste into said bituminous substance at a temperature sufficient to permit the bitumen to be kneaded and encapsulate the resin but insufficient by itself to render the bitumen fluid enough to satisfactorily encapsulate the resin without agitation, subjecting said mixture of dry radioactive waste and bituminous substance to kneading to effect encapsulation of said radioactive waste by the mechani-

cal action of said kneading, maintaining said mixture at a temperature below 120° C. during said kneading to prevent gas formation and foaming of the mixture, and discharging the kneaded, encapsulated, radioactive plastic waste into a container.

4,204,975

METHOD AND APPARATUS FOR ENCAPSULATING RADIOACTIVELY CONTAMINATED LUMPS OR GRANULAR MATERIAL IN METAL

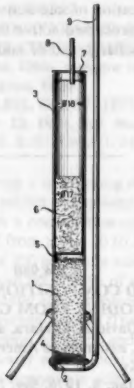
Dietrich Thiele, Julich-Stetternich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich, Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,362

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717389

Int. Cl.² G21F *9/34*

U.S. Cl. 252—301.1 W **10 Claims**



1. A method for encapsulating in metal radioactively contaminated material of granular or lump form, comprising the steps of:

filling a first section of the inside of a substantially vertically disposed tube with said contaminated material in such a way that one of the boundaries of the filled section of said tube is constituted by a porous partition at the bottom of the said first section capable of passing molten metal but impermeable to said granular or lump material;

placing a quantity of said metal in said tube in a second section thereof above and substantially adjacent to said first section thereof,

heating said quantity of metal in said tube above the melting point of said metal and evacuating the insterstices of said filling of said first section of tube by applying suction to the bottom end of said tube so as to introduce said metal in the molten state into said filling and through said porous partition by suction, and

cooling said molten metal after it has fully penetrated said first section of tube to solidify said metal and form a consolidated solid plug encapsulating said contaminated material.

4,204,976

GLASS FOR RADIO-PHOTOLUMINESCENCE DOSIMETRY

Walter Jahn, Ingelheim, and Werner Schumann, Mainz, both of Fed. Rep. of Germany, assignors to JENAER Glaswerk Schott & Gen, Mainz, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,678

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731844

Int. Cl.² C03C *3/16, 3/30*

U.S. Cl. 252—301.4 P **7 Claims**

1. A lithium-free silver-activated phosphate glass having a transparency suitable for radio-photoluminesence dosimetry, consisting essentially of, in percent by weight based on the total composition:

15–26% by weight of $NaPO_3$;

16–27% by weight $Mg(PO_3)_2$;

a radio-phospholuminescent activating amount of silver metaphosphate; and

balance, aluminum metaphosphate.

4,204,977

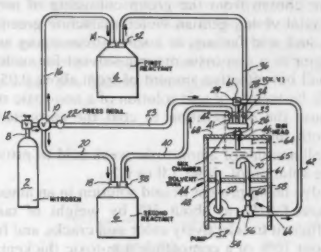
POLYURETHANE FOAM GENERATING APPARATUS

John F. Zwirlein, New Haven, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 656,157, Feb. 9, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 866,976

Int. Cl.² B01F *3/04*; B05B *15/02*

U.S. Cl. 252—359 E **12 Claims**



1. A foam generating apparatus wherein first and second inter-reactive foam-forming materials are mixed and foam generated therefrom and the generated foam is dispensed through an outlet, which apparatus comprises:

(a) first tank means, having an outlet, for providing a supply of said first material;

(b) second tank means, having an outlet, for providing a supply of said second material;

(c) first, second and third inlet valves;

(d) mixing chamber means, having an inlet and an outlet for mixing said first and second materials to generate foam and dispensing said generated foam through said mixing chamber outlet;

(e) first connector means connecting the outlet of said first tank means to said inlet through said first inlet valve;

(f) second connector means connecting said outet of said second tank means to said inlet through said second inlet valve;

(g) means for propelling said first and second materials from their respective tank means through said mixing chamber means and out of said mixing chamber outlet;

(h) control means for simultaneously opening and closing said inlet valves;

(i) third tank means for providing a supply of solvent for cleaning said mixing chamber means, said tank having an outlet;

(j) third connector means connecting said outlet of said third tank means to the inlet of said mixing chamber means through said third inlet valve;

(k) pump means in said third connector means interposed between said third tank means outlet and said third inlet valve to cause the flow of solvent through said mixing chamber means and out of said mixing chamber outlet when said inlet valve is opened, said pump means having an inlet and an outlet, fourth connector means for connecting said pump inlet to said third tank means outlet, and fifth connector means for connecting said pump outlet to said mixing chamber inlet and sixth connector means for connecting said pump outlet to the interior of said third tank means ; and

(l) means for recycling said solvent, after said solvent flows through said mixing chamber means and out of said mixing chamber outlet, back to said third tank means through said third tank inlet.

4,204,978

TOOTH CRACK DETECTOR

Robert L. Ibsen; William R. Glace, and William R. Reed, Jr., all of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.

Continuation-in-part of Ser. No. 954,841, Oct. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 830,461, Sep. 6, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,401

Int. Cl.[2] **C09K** *3/00;* **G01N** *19/08, 31/00;* **A61C** *19/00*

U.S. Cl. 252—408 **24 Claims**

1. A tooth crack detection composition for detecting ordinarily invisible cracks in a tooth in situ and in vitro, consisting essentially of:

a dye chosen from the group consisting of methyl violet, crystal violet, gentian violet, malachite green, erythrosin B, and acid fuchsin, in a solvent consisting essentially of water or a non-toxic organic solvent for such dye,

a small but effective amount of from about 0.05% to about 5% by weight of said solution of a non-toxic surfactant to cause the composition to coat the suspected area of a tooth, and

a small amount of a non-toxic weak acid to provide a ph of the solution of about 1.0 to 6.5,

said dye being present in said solution in an amount of from about 0.01% to about 5% by weight of said solution, sufficient to selectively color said cracks, and from zero to about 10% of a compatible non-toxic thickening agent.

4,204,979

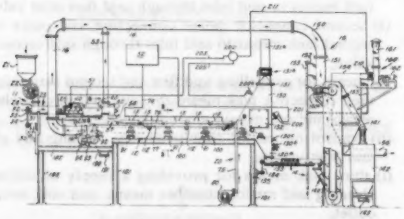
METHOD OF PROCESSING ACTIVATED CARBON

Jim F. Hobbs, 618 Winchester Dr., Richardson, Tex. 75079, and Craig Smyser, 4013 Miramar, Dallas, Tex. 75200

Division of Ser. No. 627,651, Oct. 31, 1975, Pat. No. 4,050,900, which is a continuation of Ser. No. 423,398, Dec. 10, 1973, abandoned, which is a continuation of Ser. No. 173,803, Aug. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 38,936, May 20, 1970, Pat. No. 3,648,630. This application Jun. 20, 1977, Ser. No. 808,176

Int. Cl.[2] **C01B** *31/10, 31/08;* **B01J** *21/20, 21/18*

U.S. Cl. 252—416 **9 Claims**



1. A method of thermal processing of active carbon particles for the purpose of removing material foreign to said carbon particles from internal and external surfaces of said particles comprising:

defining an elongated chamber having an inlet end and a discharge end,

supporting an endless conveyor belt for horizontal movement within said chamber,

moving said belt within said chamber such that an upper belt portion moves from said inlet end to said discharge end of said chamber and wherein a lower return belt portion moves from said discharge end to said inlet end,

receiving active carbon particles from a source and discharging said active carbon particles on said upper belt portion in the region of said inlet end of said chamber,

directing infrared rays from the upper portion of said chamber on the active carbon particles deposited on said upper belt portion as said belt moves said active carbon particles from said inlet end to said discharge end, said infrared rays being of sufficient magnitude to thermally gasify matter from said active carbon particles,

maintaining at least a partial vacuum in said chamber,

flowing gases produced by said gasifying of matter along said chamber in a direction parallel to the direction of movement of said belt for minimizing the required heat from said infrared rays,

sensing the air temperature within said chamber above said conveyor belt,

in response to the temperature sensed, controlling the temperature within said chamber in order to complete the thermal gasification of said active carbon particles, and

discharging the processed active carbon particles from said belt at said discharge end of said chamber.

4,204,980

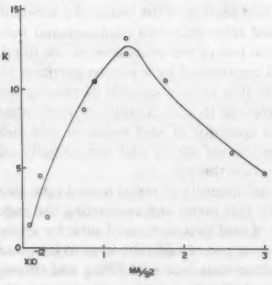
METHOD AND COMPOSITION FOR REMOVING IODINE FROM GASES

Mohiuddin Pasha; David K. O'Hara, and Joseph A. French, all of Lousiville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Jan. 8, 1976, Ser. No. 647,333

Int. Cl.[2] **B01D** *53/04;* **G21F** *9/02*

U.S. Cl. 252—428 **1 Claim**



1. A radioactive iodine-iodide sorbent material comprising a ceramic material impregnated with a mixture of silver nitrate and a water soluble secondary amine, said amine comprising triethylene diamine.

4,204,981

SUPPORTED CATALYSTS FOR THE HOMO- AND CO-POLYMERIZATION OF α-OLEFINES

Renzo Invernizzi, Milan; Ferdinando Ligorati, Usmate, and Maurizio Fontanesi, Concorezzo, all of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Sep. 29, 1978, Ser. No. 947,229
Claims priority, application Italy, Sep. 30, 1977, 28133 A/77
Int. Cl.[2] C08F 4/02, 4/64
U.S. Cl. 252—429 B 21 Claims

1. In a Ziegler catalytic system formed by the combination of an organo-metallic compound of a metal of Group I, II or III of the Periodic System of the Elements according to Mendeleef and a compound of a heavy metal of Group IV, V or VI of said Periodic System supported on a carrier, the improvement which comprises said carrier being an active complex obtained by reacting (i) one or more metal alloys each consisting of two or more metals selected from the group consisting of Mg, Fe, Al, Ni, Cr and Zn, (ii) gaseous hydrogen chloride and (iii) one or more aliphatic, cycloaliphatic, aromatic or alkylaromatic alcohols in the liquid or gaseous state, at a temperature of from 60° to 300° C., said active complex having:

(a) a content of free alcoholic hydroxyl groups of from 1 to 20% by weight;

(b) a chlorine content of from 15 to 70% by weight;

(c) a metal content of from 5 to 35% by weight;

(d) a porosity of from 0.1 to 1 cc/g; and

(e) a surface area of from 1 to 200 m^2/g.

4,204,982

LIGNIN AMINE CARBOXYLATED CONJUGATED DIENE TIRE CORD ADHESIVES

Terry C. Neubert, Ravenna, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 842,851, Oct. 17, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,533
Int. Cl.[2] C08L 9/00; C09J 3/14, 3/28
U.S. Cl. 260—5 8 Claims

1. A method for adhering a reinforcing element to a vulcanized conjugated diene rubber compound which comprises treating said element with a composition comprising an aqueous alkaline dispersion of from about 10 to 30% by weight (as dry solids) of a mixture of 100 parts of a rubbery carboxylated copolymer containing about 60 to 95% of a conjugated diolefin, about 5 to 40% of acrylic acid or lower alkyl acrylic acid and about 0 to 40% of a styrene; about 1.0 to 30 parts of a lignin amine-formaldehyde reaction product; and heat treating said element to remove the water and to heat set the solids from said composition and to deposit on said element from said composition a total of from about 2 to 30% by weight (solids), said heat treatment being conducted at temperatures of from about 150° C. to 270° C. for from about 5 to 150 seconds, cooling said treated element, combining said cooled treated element with an unvulcanized vulcanizable rubber consisting essentially of conjugated diene as the major elastomer component, and vulcanizing the same.

4,204,983

ABSORBENT POLYMERIC COMPOSITIONS DERIVED FROM AMYLACEOUS MATERIAL-FORMALDEHYDE SUBSTRATES

E. Jack Swarthout, and Phillip Antholz, both of Paris, Ill., assignors to Illinois Cereal Mills, Paris, Ill.

Filed May 7, 1979, Ser. No. 36,750
Int. Cl.[2] C08L 1/02
U.S. Cl. 260—17.4 GC 12 Claims

1. A method of forming a water-insoluble, aqueous fluid-absorbing copolymer comprising:

(a) mixing an ungelatinized amylaceous material with a formaldehyde solution containing from about 0.5 to about 9 weight percent formaldehyde based on the weight of the amylaceous material to form an amylaceous material-formaldehyde substrate;

(b) graft copolymerizing acrylonitrile onto the amylaceous material-formaldehyde substrate to form a graft copolymer;

(c) saponifying the graft copolymer in an aqueous solution to form a water-soluble saponified graft copolymer; and

(d) isolating and drying said saponified graft copolymer to form a water-insoluble, aqueous fluid-absorbing copolymer.

4,204,984

LIGNIN AMINE CARBOXYLATED CONJUGATED DIENE TIRE CORD ADHESIVES

Terry C. Neubert, Ravenna, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Oct. 17, 1977, Ser. No. 842,851
Int. Cl.[2] C08L 9/00, 47/00; C09J 3/14, 3/28
U.S. Cl. 260—17.5 3 Claims

1. A composition comprising an aqueous alkaline dispersion of a minor amount by weight of a mixture of 100 parts of a copolymer of a conjugated diolefin having 4 to 6 carbon atoms and an acrylic acid or lower alkyl substituted acrylic acid and from 6 to 30 parts of a reaction product of formaldehyde and a lignin amine, wherein the lignin amine is selected from the class consisting of a reaction product of lignin, formaldehyde and a primary or secondary amine; a reaction product of lignin with a reaction product of an epichlorohydrin and a tertiary amine; and a a salt of a quaternized lignin amine.

4,204,985

Patent Not Issued For This Number

4,204,986

SEALING, CAULKING AND PROTECTIVE SHIELDING COMPOSITION OF THERMOPLASTIC SYNTHETIC MATERIALS AND CARBONACEOUS MATERIALS

Ingo Romey, Hünxe; Aloys Schlütter, and Rolf Sommerfeld, both of Kempen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Ruhrkohle AG, both of Essen, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,391
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1978, 2801154
Int. Cl.[2] C08L 91/00
U.S. Cl. 260—28.5 AS 11 Claims

1. A sealing, packing, caulking and protective shielding composition comprising a mixture of (a) at least one synthetic thermoplastic compound which may include at least one elastomer having thermoplastic properties and (b) between 3 and 97% by weight of a carbonaceous material obtained by the liquefaction of coal which material has a boiling point above 350° C. at atmospheric pressure.

4,204,987

AQUEOUS POLYESTER DISPERSION FOR ADHERING VINYL FILM TO WOOD

Roger L. Streets, Mansfield; Thomas G. Rabito, Ashland, and John Von Kamp, New London, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 31, 1975, Ser. No. 627,722

Int. Cl.[2] C08L *67/02;* **C08J** *5/12*

U.S. Cl. 260—29.2 E **4 Claims**

1. An adhesive composition capable of adhering a vinyl film to wood, consisting of a mixture of 100 parts by weight of saturated polyester of an organic dicarboxylic acid or its anhydride with a glycol and 80 to 125 parts by weight of a carrier, 50 to 160 parts by weight of water and an emulsifying agent, said mixture being mixed to give an oil in water dispersion of 30 to 55 percent solids, said polyester having a molecular weight of 10,000 to 30,000.

4,204,988

METHOD OF FORMING A PRODUCT FOR USE AS A CONCRETE SUBSTITUTE

Pierre A. Crouzet, 20 Romney Way, Parkwood, Western Australia, Australia

Division of Ser. No. 773,097, Feb. 28, 1977, Pat. No. 4,115,336, which is a continuation-in-part of Ser. No. 711,182, Aug. 3, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,700

Claims priority, application Australia, Aug. 7, 1975, PC2687; Apr. 27, 1976, 13401/76

Int. Cl.[2] C04B *7/35;* **C08J** *3/06, 9/28;* **C08L** *67/06*

U.S. Cl. 260—29.6 S **28 Claims**

1. A method of forming a product which method comprises the steps of

(A) preparing a water in resin emulsion by mixing

(i) water with

(ii) a mixture consisting essentially of (a) an unsaturated polyester resin having a molecular weight from about 3100 to 3600 formed by a condensation polymerization reaction, which is allowed to proceed until the polyester has an acid number of no more than about 25, between polyhydric and polycarboxylic compounds or derivatives thereof, said polyhydric compounds being present in excess over stoichiometric requirements, at least one of said compounds being unsaturated, the remainder being saturated; and (b) an unsaturated monomer; the mixture (ii) containing no more than about 30% by weight of the unsaturated monomer (b); wherein said emulsion is so stable that demulsification does not occur when a setting agent of the kind hereinafter defined is added thereto;

(B) mixing the water in resin emulsion of step (A) with a setting agent of a kind which sets by hydration thereof to form a hardenable mixture;

(C) causing an addition polymerization reaction to occur between said unsaturated polyester resin and said unsaturated monomer; and

(D) allowing the hardenable mixture to harden thereby forming a product, wherein the quantity of emulsion mixed with the setting agent is such that sufficient water is provided by said emulsion to allow said hydration to occur.

4,204,989

ISOLATION OF HEPATITIS B e ANTIGEN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 13, 1978, Ser. No. 968,896

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 B **10 Claims**

1. A method for isolating hepatitis B e antigen or hepatitis B e antibody which comprises isopycnically banding human biological fluid which contains hepatitis B surface antigen, recovering a fraction having a density range of from about 1.04 to about 1.15 g/cc, and and isolating HB_eAb if the plasma has an HB_sAg titer measured by complement fixation of at least about 256, or isolating HB_eAg if the plasma has an HB_sAg titer measured by complement fixation of less than about 128.

4. A method for isolating hepatitis B e antigen which comprises isopycnically banding human biological fluid which has a hepatitis B surface antigen titer measured by complement fixation of at least about 256, recovering a first fraction having a density range of from about 1.04 to about 1.15 g/cc, recovering a second fraction in the density range of from about 1.17 to about 1.22 g/cc, dialyzing and concentrating the second fraction, subjecting the concentrated second fraction to rate zonal banding and recovering a third fraction having a density range of from about 1.04 to about 1.15 g/cc, and dialyzing and concentrating the first and third fractions.

4,204,990

SOMATOSTATIN ANALOGUES

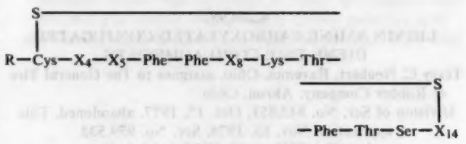
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 777,276, Mar. 14, 1977, and a continuation-in-part of Ser. No. 830,929, Sep. 6, 1977, abandoned. This application Apr. 12, 1978, Ser. No. 895,577

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 S **7 Claims**

1. A polypeptide of the formula:



its linear precursors or a non-toxic acid addition salt thereof in which:

R is hydrogen, lower alkanoyl, benzoyl, Ala-Gly-, Gly-Gly-Gly, Ala-D-Ala, or p-Glu;

X_4 is Arg or Lys;

X_5 is D-Tyr, D-Trp, D-Ser, D-His or D-Arg;

X_8 is L-Trp or D-Trp and

X_{14} is Cys or D-Cys.

4,204,991

SARCOSINE[1] DEHYDROALANINE[8] ANGIOTENSIN II DERIVATIVES

E. Ann Hallinan, Evanston, and Robert H. Mazur, Deerfield, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

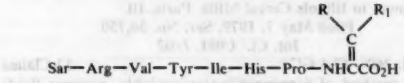
Continuation-in-part of Ser. No. 844,999, Oct. 25, 1977, abandoned. This application May 14, 1979, Ser. No. 39,025

Claims priority, application United Kingdom, Oct. 24, 1978, 41664/78

Int. Cl.[2] C07C *103/52;* **H61K** *37/00*

U.S. Cl. 260—112.5 R **4 Claims**

1. Compounds of the formula



wherein R is hydrogen or an alkyl radical containing 1–4 carbon atoms; R_1 is hydrogen or an alkyl radical containing 1–4 carbon atoms; and the stereochemical configuration of each of the optically active amino acid residues is L or DL.

4,204,992
METHOD FOR PREPARING PYROGEN FREE COLLAGEN

Mamerto M. Cruz, Jr., Pennington, N.J., assignor to Avicon, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 828,350, Aug. 29, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,661
Int. Cl.[2] C07G 7/00; C08H 1/06; C08L 89/04
U.S. Cl. 260—123.7 12 Claims

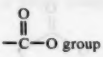
1. The method for producing pyrogen free collagen which comprises removing mechanically foreign substances from the surfaces of the collagen while in contact with an aqueous solution of an alkalie or alkaline earth metal hypochlorite, washing the collagen with an aqueous ethanol solution and thereafter washing the collagen with pyrogen free water.

4,204,993
NONDIFFUSIBLE 6-ARYLAZO-2-AMINO-3-PYRIDINOL DYE-RELEASING COMPOUNDS

Derek D. Chapman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 927,188, Jul. 24, 1978, abandoned, which is a division of Ser. No. 822,189, Aug. 5, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,836
Int. Cl.[2] C09B 29/36; G03C 1/40, 5/54, 7/00
U.S. Cl. 260—156 14 Claims

1. A nondiffusible compound having a releasable 6-arylazo-2-amino-3-pyridinol dye moiety or precursor thereof, said compound containing in the ortho position of the arylazo moiety a ballasted carrier moiety attached thereto either through a sulfonamido linking group or through the oxygen of a



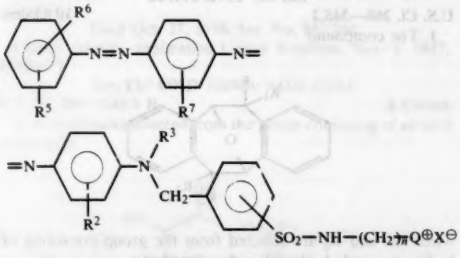
which said ballasted carrier moiety contains, and wherein said ballasted carrier moiety will release said diffusible 6-arylazo-2-amino-3-pyridinol dye or precursor thereof under alkaline conditions.

4,204,994
AZOANILINO-TOLUENE SULFONAMIDOALKYLENEAMINE CATIONIC DISAZO DYES FOR PAPER

Kishor A. Desai, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Jan. 18, 1979, Ser. No. 4,442
Int. Cl.[2] C09B 31/02
U.S. Cl. 260—174 2 Claims

1. A cationic disazo dye characterized by outstanding affinity for paper pulp and having the structural formula:



wherein

R^2 is H, lower alkyl, lower alkoxy, chloro or bromo;

R^3 is lower alkyl or cyano lower alkyl;

R^5 and R^6 are independently H, chloro, bromo, lower alkyl, lower alkoxy or N,N-di(lower alkyl)sulfonamido;

R^7 is H, lower alkyl, lower alkoxy, chloro or bromo;

n is an integer of 2–4;

Q is $N(R^4)_3$, where R^4 is lower alkyl, or is

; and

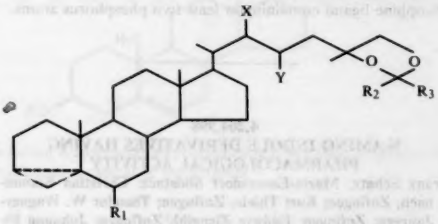
X is chloro, bromo, methosulfate, ethosulfate or methanesulfate.

4,204,995
CHOLESTANE DERIVATIVES

Richard Barner, Witterswil, and Joseph Hübscher, Seon, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 26, 1979, Ser. No. 15,021
Claims priority, application Switzerland, Mar. 15, 1978, 2818/78
Int. Cl.[2] C07J 17/00
U.S. Cl. 260—239.55 C 5 Claims

1. A cholestane derivative of the formula



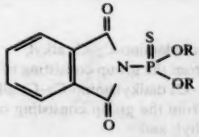
wherein R_1 is lower alkoxy, R_2 and R_3 each independently is lower alkyl or R_2 and R_3 taken together are lower alkylene, X is hydrogen, hydroxy or $—OSO_2R_4$ where R_4 is lower alkyl, phenyl or substituted phenyl, and Y is hydrogen or X and Y taken together are a carbon-carbon bond.

4,204,996
PREPARATION OF O,O-DIALKYL PHTHALIMIDO-PHOSPHONOTHIOATE

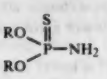
David P. Clifford, Kings Lynn, England, assignor to Dow Chemical Company Limited, London, England

Filed Nov. 2, 1978, Ser. No. 957,115
Int. Cl.[2] C07D 209/48
U.S. Cl. 260—326 E 15 Claim

1. A method of preparing a compound of the formula



which method comprises reacting a phthalic anhydride wit compound of the formula



in the presence of an effective catalytic amount of at least one tertiary amine, said amine being an aliphatic tertiary amine of the formula NR_3 or a cyclic tertiary amine of the formula $(CH_2)_n$ N—R where n is 4, 5 or 6, wherein, in all of the above formulas each R substituent is, individually, an alkyl group having from 1 to 4 carbon atoms, thereby to produce a dialkyl phthalimidophosphonothioate.

4,204,997

ASYMMETRIC AMINATION OF 1,3-DIENES

Charles F. Hobbs, Des Peres, and Dudley E. McMackins, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1979, Ser. No. 21,387
Int. Cl.[2] C07D *207/06*; C07C *85/18*
U.S. Cl. 260—326.8 **14 Claims**

1. A process for the asymmetric synthesis of amines which comprises amination of a conjugated diene having from 4 to about 20 carbon atoms in the presence of a catalyst system comprising a palladium compound and an optically active phosphine ligand containing at least two phosphorus atoms.

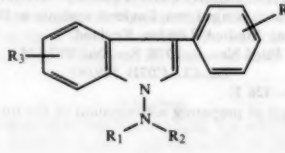
4,204,998

N-AMINO INDOLE DERIVATIVES HAVING PHARMACOLOGICAL ACTIVITY

Franz Schatz, Maria-Enzersdorf Südstadt; Christian Stammbach, Zofingen; Kurt Thiele, Zofingen; Theodor W. Wagner-Jauregg, Zofingen; Ludwig Zirngibl, Zofingen; Johanna Fischer, Reiden, and Ulrich Jahn, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Continuation of Ser. No. 813,856, Jul. 8, 1977, abandoned, which is a continuation of Ser. No. 565,739, Mar. 31, 1975, abandoned.
This application May 5, 1978, Ser. No. 903,128
Claims priority, application Switzerland, Mar. 29, 1974, 4339/74
Int. Cl.[2] C07D *209/44, 209/08, 249/18, 235/22*
U.S. Cl. 260—326.15 **8 Claims**

1. A compound of the formula:



wherein:

R_1 is C_1–C_3 dialkylamino-C_2–C_5 alkyl;

R_2 is selected from the group consisting of hydrogen, C_1–C_3 alkyl and C_1–C_3 dialkylamino-C_2–C_5 alkyl;

R_3 is selected from the group consisting of hydrogen, halogen and methyl; and

R_4 is selected from the group consisting of hydrogen, methyl, methoxy and chloro

and pharmaceutically acceptable salts of such compounds.

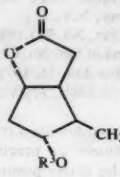
4,204,999

PROCESS FOR MAKING BICYCLIC LACTONE DERIVATIVES FOR USE AS INTERMEDIATES IN THE SYNTHESIS OF PROSTAGLANDINS

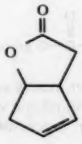
Istvan Tömösközi; Gabor Kovacs, both of Budapest; Istvan Szekely, Szentendre; Vilmos Simonidesz, Budapest; Marianna Lovasz nee Gaspar, Budapest; Borbala Keresztes nee Ordög, Budapest; Julia Remport nee Radoczi, Budapest; Istvan Stadler, Budapest; Zsuzsa Visky nee Gombos, Budapest, and Csaba Szantay, Budapest, all of Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Division of Ser. No. 770,998, Feb. 22, 1977, Pat. No. 4,126,622.
This application Oct. 20, 1978, Ser. No. 952,950
Claims priority, application Hungary, Feb. 20, 1976, CI 1644
Int. Cl.[2] C07D *493/02, 307/77*
U.S. Cl. 260—340.3 **7 Claims**

1. A process for the preparation of an optically active or racemic 4-beta, 5-alpha-lactone diol of the Formula I



wherein R^3 and R^4 are each hydrogen, which comprises reacting a racemic or optically active lactone of the Formula II



with formaldehyde or with a formaldehyde polymerizate in the presence of a mixture of a strong acid and water to yield a compound of the Formula I.

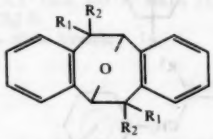
4,205,000

DIBENZO-OXA-BICYCLONONA-2,6-DIENES

Jacques Kagan, Wilmette, Ill., assignor to The University of Illinois Foundation, Urbana, Ill.

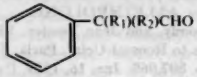
Filed Nov. 24, 1978, Ser. No. 963,454
Int. Cl.[2] C07D *311/02*
U.S. Cl. 260—345.2 **10 Claims**

1. The compound



where R_1 and R_2 are selected from the group consisting of hydrogen, methyl, phenyl, and carboethoxy.

6. A process for preparing dibenzo-9-oxa-bicyclonona-2,6-dienes comprising condensing in the presence of a strong acid a phenylacetaldehyde having the formula



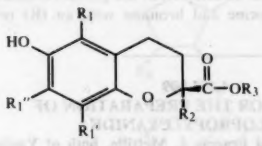
where R_1 and R_2 are selected from the group consisting of hydrogen, methyl, phenyl, and carboethoxy, said strong acid having an acid strength within the range defined by sulfuric acid and fluorosulfuric acid.

4,205,001
INVERSION PROCESS

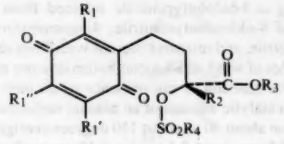
Noal Cohen, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 873,185, Jan. 30, 1978, Pat. No. 4,150,050. This application Jan. 11, 1979, Ser. No. 2,485
Int. Cl.[2] C07D *311/72*
U.S. Cl. 260—345.5 **4 Claims**

1. A process for producing a compound of the formula



wherein R_1, R_1' and R_1'' are independently hydrogen or lower alkyl; and R_2 and R_3 are lower alkyl; comprising reducing in a polar solvent a compound of the formula



wherein

R_1, R_1', R_1'', R_2 and R_3 are as above; and

R_4 is lower alkyl

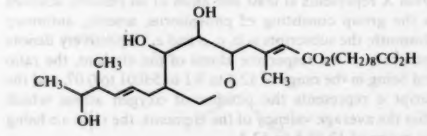
either in the presence of a base or followed by the addition of a base.

4,205,002
ANTIBACTERIAL COMPOUNDS

Norman H. Rogers, Rudgwick, and Peter J. O'Hanlon, Redhill, both of England, assignors to Beecham Group Limited, England

Filed Oct. 27, 1978, Ser. No. 955,196
Claims priority, application United Kingdom, Nov. 1, 1977, 45305/77
Int. Cl.[2] C07D *309/06*; A61K *31/35*
U.S. Cl. 260—345.8 R **6 Claims**

1. A compound selected from the group consisting of an acid of formula:



or a pharmaceutically acceptable salt or ester thereof.

4,205,003
2-[5-(4-CHLOROPHENYL)FURFURYL]-1,3,-PROPANEDIOL

Chia-Nien Yu, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,472
Int. Cl.[2] C07D *307/46*
U.S. Cl. 260—347.8 **1 Claim**

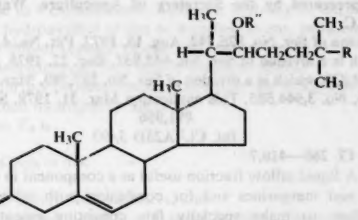
1. The compound 2-[5-(4-chlorophenyl)furfuryl]-1,3,-propanediol.

4,205,004
25-ALKYLCHOLEST-5-ENE-3β,22-DIOLS AND ESTERS THEREOF

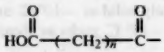
Robert J. Chorvat, Arlington Heights, Ill., assignor to D. G. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 828,385, Aug. 29, 1977. This application Jul. 28, 1978, Ser. No. 929,068
Int. Cl.[2] C07J *9/00*
U.S. Cl. 260—397.2 **3 Claims**

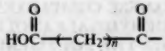
1. A compound of the formula



wherein R represents alkyl containing fewer than 5 carbons; R' represents a radical of the formula



wherein n represents a positive integer less than 4; and R'' represents hydrogen, acetyl, or a radical of the formula



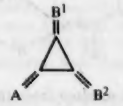
wherein n is defined as before.

4,205,005
ANTHRAQUINO-CYCLOALKANE DYES

Judith B. Fahey, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 11, 1977, Ser. No. 823,628
Int. Cl.[2] C07C *49/76*; C09B *3/78*
U.S. Cl. 430—72 **8 Claims**

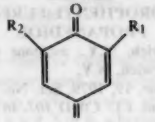
1. The dyes which can be represented by the formulae:



wherein

A consists of an anthraquinoid group;

B^1 and B^2 consist of
(I) A, or



wherein R_1 and R_2 individually are H or C_1 to C_5 alkyl; or
(2) B^1 is an anthraquinoid group and B^2 is an exocyclic double bond with oxygen, =0.

4,205,006

PHYSIOCHEMICALLY DESIGNED FAT COMPOSITIONS FROM TALLOW AND PROCESS FOR MAKING

Francis E. Luddy, Hatboro; James W. Hampson; Samuel F. Herb, both of Philadelphia, and Herbert L. Rothbart, Flourtown, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 825,742, Aug. 18, 1977, Pat. No. 4,130,572, which is a division of Ser. No. 642,837, Dec. 22, 1975, Pat. No. 4,049,839, which is a division of Ser. No. 337,789, Mar. 5, 1973, Pat. No. 3,944,585. This application Mar. 31, 1978, Ser. No. 891,956
Int. Cl.² A23D *5/00*
U.S. Cl. 260—410.7 **1 Claim**

1. A liquid tallow fraction useful as a component in shortenings and margarines and for combining with other tallow fractions to make specialty fats consisting essentially of monosaturated, triunsaturated glycerides having a gas-liquid chromatographic profile indicating a composition having 4%, 18%, 45% and 33% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating that it it not completely solid at −15° C. and that the portion that does solidify at −15° C. melts at about 5° C.

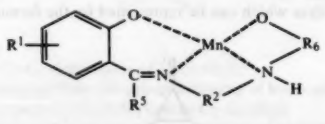
4,205,007

MANGANESE COMPLEXES OF SALICYL-ALDEHYDE-ALKANOLIMINES AS CATALYSTS FOR THE POLYMERIZATION OF 2,6-DI-SUBSTITUTED PHENOLS

Walter K. Olander, Clifton Park, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 753,506, Dec. 21, 1976, Pat. No. 4,093,597. This application Feb. 22, 1978, Ser. No. 880,135
Int. Cl.² C07F *00/00*
U.S. Cl. 260—429 C **4 Claims**

1. A catalyst for the oxidative coupling of a phenolic monomer which comprises a compound of the formula:



wherein R^1 and R^5 are selected from the group consisting of hydrogen, lower alkyl of from 1 to 8 carbon atoms and phenyl; and R^2 and R^6 are independently lower alkylene of from 2 to 3 carbon atoms or o-phenylene.

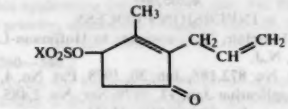
4,205,008

OPTICALLY ACTIVE SULFONATES OF ALLETHROLONE

Jacques Martel, Bondy, and Jean Tessier, Vincennes, both of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 807,069, Jun. 16, 1977, Pat. No. 4,128,584. This application Sep. 25, 1978, Ser. No. 945,328
Claims priority, application France, Jun. 23, 1976, 76 19087
Int. Cl.² C07C *143/68*
U.S. Cl. 260—456 R **4 Claims**

1. Optically active sulfonates of allethrolone of the formula



wherein X is selected from the group consisting of alkyl of 1 to 3 carbon atoms and phenyl optionally substituted in the para position with a member selected from the group consisting of methyl, fluorine, chlorine and bromine with an (R) or (S) configuration.

4,205,009

PROCESS FOR THE PREPARATION OF CYCLOPROPYLCYANIDE

Michael J. Onore, and Francis J. Mettille, both of Ypsilanti, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 7, 1979, Ser. No. 9,996
Int. Cl.² C07C *121/46*
U.S. Cl. 260—464 **10 Claims**

1. A process for the preparation of cyclopropylcyanide comprising reacting a 4-halobutyronitrile selected from the group consisting of 4-chlorobutyronitrile, 4-bromobutyronitrile, 4-iodobutyronitrile, and mixtures thereof with from about 1.0 to about 3.5 moles of solid alkali metal hydroxide per mole of 4-halobutyronitrile reactant in the presence of an inert organic solvent and a catalytic amount of an anionic surfactant at a temperature of from about 40 to about 150 degrees centigrade and at a pressure of from about 0.1 to about 10 atmospheres.

4,205,010

METHOD FOR THE CATALYTICAL PRODUCTION OF ACRYLONITRILE

Sumio Umemura; Kyoji Ohdan; Taizo Uda; Tokuo Matsuzaki; Mikio Hidaka; Yasuo Nakamura, and Masao Tsuruoka, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 30, 1976, Ser. No. 718,513
Claims priority, application Japan, Sep. 5, 1975, 50/107085
Int. Cl.² C07C *120/14*
U.S. Cl. 260—465.3 **26 Claims**

1. A method for the catalytical production of acrylonitrile, comprising contacting a reaction feed containing propylene, ammonia and molecular oxygen in a gas phase at an elevated temperature with a catalyst consisting of an oxide composition of the empirical formula:

$$Mo_aCo_bFe_cX_dO_e$$

wherein X represents at least one atom of an element selected from the group consisting of phosphorus, arsenic, antimony and bismuth; the subscripts a, b, c, d and e, respectively denote the numbers of the respective atoms of the element, the ratio a:b:c:d being in the range of 12:4 to 9:1 to 5:0.01 to 0.07; and the subscript e represents the number of oxygen atoms which satisfies the average valency of the elements, the ratio a:e being in the range of 12:39.5 to 52.7.

4,205,011
INTER-PHENYLENE-ω-ARYL-PG AMIDES

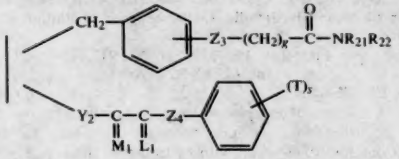
Walter Morozowich, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 788,455, Apr. 18, 1977, Pat. No. 4,100,192. This application Apr. 20, 1978, Ser. No. 898,224

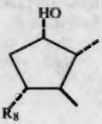
Int. Cl.[2] C07C *103/20*

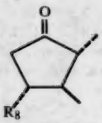
U.S. Cl. 260—558 R 48 Claims

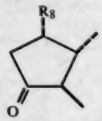
1. A prostaglandin analog of the formula

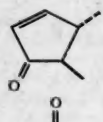


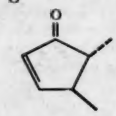
wherein D is











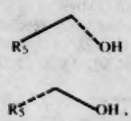
wherein R_8 is hydrogen or hydroxy;
wherein Y_1 is
(1) trans—CH=CH—, or
(2) cis—CH=CH—,
wherein g is one, 2, or 3;
wherein Z_3 is oxa or methylene;
wherein L_1 is

or a mixture of

and

-continued

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_{21} and R_{22} are
(i) hydrogen;
(ii) alkyl of one to 12 carbon atoms, inclusive;
(iii) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(iv) aralkyl of 7 to 12 carbon atoms, inclusive;
(v) phenyl;
(vi) phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy or nitro;
(vii) hydroxyalkyl of one to 4 carbon atoms, inclusive;
(viii) dihydroxyalkyl of one to 4 carbon atoms; or
(ix) trihydroxyalkyl of one to 4 carbon atoms;
with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl.
wherein Z_4 is

—$(CH_2)_h$ or oxa,

wherein h is zero to 3, inclusive, and
wherein s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,205,012
MANUFACTURE OF AMINES FROM ALCOHOLS WITH ZEOLITE FU-1 CATALYSTS

David G. Parker, and Alan J. Tompsett, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 19, 1979, Ser. No. 31,604

Claims priority, application United Kingdom, Apr. 21, 1978, 15865/78

Int. Cl.[2] C07C *85/06*

U.S. Cl. 260—583 J 10 Claims

1. A process for the manufacture of an amine which comprises reacting an alcohol with ammonia at an elevated temperature in the presence of a catalyst comprising zeolite FU-1 in which some or all of the protons of the zeolite have been replaced by monovalent cations.

4,205,013
PROCESS FOR THE MANUFACTURE OF 2,3-DIMETHYLPENTANAL

Jürgen Weber, Oberhausen, and Helmut Springer, Voerde, both of Fed. Rep. of Germany, assignors to Ruhrchemie Atkiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,380

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2716288

Int. Cl.[2] C07C *45/10*

U.S. Cl. 568—451 8 Claims

1. In a process for the preparation of 2,3-dimethylpentanal by hydroformylation of 3-methyl-2-pentene with carbon mon-

oxide and hydrogen in the presence of a rhodium containing catalyst at an elevated temperature and pressure and at a time sufficient to produce 2,3-dimethylpentanal, the improvement wherein said rhodium containing catalyst is a non-phosphene rhodium carbonyl catalyst.

4,205,014

PROCESS FOR 1,2,4,5-TETRACHLOROBENZENE

Irvin W. Potts, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 869,562, Jan. 16, 1978. This application Apr. 30, 1979, Ser. No. 34,785

Int. Cl.[2] C07C *25/00*

U.S. Cl. 260—650 R **8 Claims**

1. In the process of preparing 1,2,4,5-tetrachlorobenzene, the process comprising contacting at reactive conditions 1,2,4-trichlorobenzene and chlorine gas in the presence of a catalytic amount of Lewis acid, the improvement comprising using as a cocatalyst at least one polymeric compound having a plurality of iodinated benzene nuclei.

4,205,015

DEHYDROHALOGENATION OF (POLYHALOALKYL) BENZENES WITH SUPPORT LEWIS ACID CATALYSTS

Chun S. Wang; Stanley D. McGregor, and Terry J. Nestrick, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 18, 1978, Ser. No. 906,893

Int. Cl.[2] C07C *25/00*

U.S. Cl. 260—651 R **6 Claims**

1. A process for the dehydrohalogenation of a (polyhaloalkyl)arene wherein in the polyhaloalkyl one halogen is a benzylic chlorine or benzylic bromine and at least one halogen is a non-benzylic chlorine or bromine which process comprises contacting said (polyhaloalkyl)arene with a catalytic amount of a suitably active Lewis acid deposited on an inert solid particulate support under dehydrohalogenation conditions in the liquid phase at a temperature below 100° C. such that the benzylic halogen is selectively eliminated to form a (haloalkenyl)arene.

4,205,016

MULTIFUNCTIONAL LITHIUM CONTAINING INITIATOR

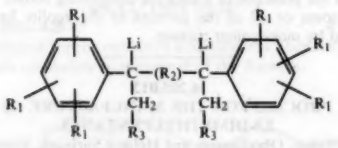
Lu H. Tung; Grace Y-S. Lo; Joseph W. Rakshys, and Douglas E. Beyer, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 859,356, Dec. 12, 1977, which is a continuation-in-part of Ser. No. 601,577, Aug. 1, 1975, abandoned. This application Aug. 7, 1978, Ser. No. 931,790

Int. Cl.[2] C07F *1/02*

U.S. Cl. 260—665 R **16 Claims**

1. A multifunctional, lithium containing, polymerization initiating compound of the Formula:



wherein

R_1 is individually selected from the group consisting of hydrogen, an alkyl hydrocarbon radical, a cycloalkyl hydrocarbon radical, alkoxy radical, and an aromatic radical with the further limitation that R_1 contains from 0 to 16 carbon atoms;

R_2 is a divalent organic radical having at least 6 carbon atoms, R_2 having at least one aromatic ring and the aromatic ring being directly attached to a carbon which is attached to an aromatic ring of the above formula, with the further limitation R_2 contains carbon and hydrocarbon, and optionally oxygen; oxygen when present is present only in the configuration of a diphenyl oxide;

R_3 is selected from the group consisting of alkyl, cycloalkyl, and aromatic radicals containing from 1 to 20 carbon atoms.

4,205,017

HYDRODEHYDROXYLATION PROCESS USING A RHENIUM-FLUORIDED ALUMINA CATALYST

Geir Bjornson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 19, 1978, Ser. No. 917,045

Int. Cl.[2] C07C *15/00*

U.S. Cl. 585—469 **6 Claims**

1. A hydrodehydroxylation process which comprises contacting at least one substituted aromatic compound having at least one hydroxyl group with hydrogen in the presence of a catalyst consisting essentially of rhenium and fluorided alumina under hydrodehydroxylation conditions sufficient to dehydroxylate at least one of said aromatic compounds and produce dehydroxylated products at high conversion and high selectivity.

4,205,018

RADIATION CURABLE RESIN COMPOSITION

Kohtaro Nagasawa; Osamu Ogitani, both of Tokyo, and Ryuichi Fujii, Soka, all of Japan, assignors to Somar Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1978, Ser. No. 957,502

Claims priority, application Japan, Nov. 3, 1977, 52-132053; Nov. 14, 1977, 52-135766

Int. Cl.[2] C08L *61/02*

U.S. Cl. 525—404 **11 Claims**

1. A radiation curable resin composition comprising, as essential ingredients:

(I) a urethanized epoxy resin obtained by reacting a compound containing at least one epoxy group and at least one hydroxyl group with a compound containing at least one isocyanate group, or a urethanized epoxy resin acrylate or methacrylate obtained by the addition of acrylic acid or methacrylic acid to said urethanized epoxy resin;

(II) a ketone resin obtained by condensing a ketone compound with an aldehyde, and

(III) a cross-linkable or polymerizable compound containing at least two ethylenically unsaturated groups, wherein said Components (I), (II) and (III) are present in amounts of 2 to 55% by weight for Component (I), 5 to 40% by weight for Component (II), and 5 to 93% by weight for Component (III).

4,205,019

PROCESS FOR PRODUCING THERMOPLASTIC RESIN

Takesaburo Shima, Saijo; Hiroshi Kozima; Tomio Yoshida, both of Niihama, and Joji Nakamura, Nishinomiya, all of Japan, assignors to Sumitamo Naugatuck Co., Ltd., Japan

Continuation of Ser. No. 750,766, Dec. 15, 1976, Pat. No. 4,112,021. This application Dec. 12, 1977, Ser. No. 860,029

Claims priority, application Japan, Dec. 26, 1975, 50-156731

Int. Cl.[2] C08F *279/04*

U.S. Cl. 525—243 **2 Claims**

1. A thermoplastic resin, which is produced by emulsion polymerizing monomers consisting of 80 to 60% by weight of an aromatic monovinyl monomer and 20 to 40% by weight of a vinyl cyanide monomer in the presence of an aqueous elastomeric latex, said monomers being used in the ratio of 20 to 100 parts by weight per 100 parts by weight of the elastomer contained in the aqueous elastomeric latex; mixing with agitation the resulting copolymer latex with monomers consisting of 80 to 60% by weight of an aromatic monomvinyl monomer and

20 to 40% by weight of a vinyl cyanide monomer in the presence of a polyalkylene oxide selected from the group consisting of polyethylene oxide and polypropylene oxide and a coagulant selected from the group consisting of an inorganic acid having a dissociation constant of 1×10^{-5} or more at 25° C., an organic acid having 1 to 10 carbon atoms and having a dissociation constant of 1×10^{-5} or more at 25° C. and a water-soluble salt of the inorganic or organic acid with a monovalent, divalent or trivalent metal, said monomers being used in the ratio of 100 to 1000 parts by weight per 100 parts by weight of the elastomer contained in the resulting copolymer latex; and suspension polymerizing the mixture.

4,205,020

GRAFT COPOLYMERS CONTAINING RUBBER, ACRYLONITRILE AND AN AROMATIC OLEFIN

Brian N. Hendy, Knebworth; Carl F. Mathews; Eric Nield, both of Ware; John B. Rose, St. Albans, and Peter I. Vincent, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 573,329, Apr. 30, 1975, Pat. No. 4,151,224, which is a continuation of Ser. No. 107,563, Jan. 18, 1971, abandoned, which is a continuation of Ser. No. 755,801, Aug. 28, 1968, abandoned, which is a continuation-in-part of Ser. No. 622,904, Mar. 14, 1967, abandoned. This application Feb. 13, 1979, Ser. No. 11,897

Claims priority, application United Kingdom, Mar. 24, 1966, 13071/66; Sep. 20, 1967, 42899/67

Int. Cl.² C08L 9/00, 47/00

U.S. Cl. 525—275 **18 Claims**

1. A graft copolymer consisting essentially of up to 95% by weight of a substrate of a diene rubber containing from 40% to 100% molar of units from at least one conjugated 1,3-diene monomer and from 0 to 60% molar of units from at least one other ethylenically unsaturated monomer copolymerizable therewith using free radical catalysts, and a homogeneous superstrate consisting of units of acrylonitrile, randomly distributed units of at least one monovinylidene aromatic compound, the molar ratio of units of acrylonitrile to units of said monovinylidene aromatic compound in the superstrate being between 2 and 9, and 0 to 5% molar of ethylenically unsaturated monomer copolymerizable with acrylonitrile and said monovinylidene aromatic compound using free radical catalysts, said graft copolymer being the product obtained by forming a mixture of said rubber, a portion of said monovinylidene aromatic compound and at least a portion of said acrylonitrile and said ethylenically unsaturated monomer, polymerizing said mixture and adding quantities of a monomeric feed selected from the group consisting of said monovinylidene aromatic compound and mixtures of said monovinylidene aromatic compound with any of said acrylonitrile and said ethylenically unsaturated monomer not present in said mixture, said monomeric feed being added to said mixture at a rate determined by the rate of polymer formation and such that the relative concentration of said monovinylidene aromatic compound and acrylonitrile in the reaction mixture remains at about the initial level.

4,205,021

ETHYLENE COPOLYMERS

Yoshinori Morita; Hiroshi Inoue, both of Iwakuni, and Kenji Fujiyoshi, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Jan. 18, 1978, Ser. No. 870,365

Claims priority, application Japan, Jan. 27, 1977, 52-7315

Int. Cl.² C08F 210/14; C08L 23/20

U.S. Cl. 525—240 **12 Claims**

1. A copolymer consisting essentially of ethylene and an α-olefin with 5 to 18 carbon atoms, said copolymer having

(i) a density of 0.90 to 0.94 g/cm³,

(ii) an intrinsic viscosity [η] of 0.8 to 4.0 dl/g,

(iii) a maximum melting point, determined by differential thermal analysis, of 115° to 130° C., and

(iv) a $g_\eta^*(=[\eta]/[\eta]_l)$ value of 0.05 to 0.78, in which formula [η] is the intrinsic viscosity of the copolymer and $[\eta]_l$ is the intrinsic viscosity of a linear polyethylene having the same weight average molecular weight determined by the light scattering method as said copolymer.

10. A composition comprising a blend of the copolymer of claim 1 with polyethylene.

4,205,022

2,2-BIS(HALOALKYL)-3-HYDROXY-1-PROPYL PHOSPHORIC ACIDS

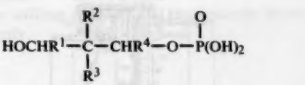
Richard R. Nicholson; Ray E. Smith, and Jayendra G. Shukla, all of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Sep. 5, 1978, Ser. No. 939,629

Int. Cl.² C07F 9/09

U.S. Cl. 260—953 **5 Claims**

1. A compound of the formula



wherein R^1 and R^4 are independently selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and haloalkyl of 1 to 4 carbon atoms and 1 to 2 halogen atoms; and R^2 and R^3 are each haloalkyl containing 1 to 4 carbon atoms and 1 to 2 halogen atoms selected from the group consisting of chlorine, bromine and mixtures thereof.

4,205,023

PROCESS FOR REMOVING SOLUBLE METALLIC SALTS FROM A PHOSPHATE ESTER FUNCTIONAL FLUID

Joseph F. Anzerberger, Sr., New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 2, 1978, Ser. No. 947,790

Int. Cl.² C07F 9/09

U.S. Cl. 260—990 **12 Claims**

1. A process for removing dissolved metallic salts from a functional fluid consisting essentially of a phosphate ester and dissolved metallic salts comprising:

(a) contacting the functional fluid with an effective amount of a chelating agent which is substantially free of water, the chelating agent being capable of precipitating at least part of the metallic salts contained therein to form a precipitate and being selected from the group consisting of:

(i) triethanol amine;

(ii) ethylenediaminetetraacetic acid;

(iii) diethylenetriaminepentaacetic acid;

(iv) N-hydroxyethylenediaminetriacetic acid;

(v) the alkali metal, alkaline earth or ammonium salts of (i) through (iv); and

(vi) mixtures of (i) through (v); and subsequently

(b) separating the precipitate from the functional fluids.

4,205,024

CARBURETOR

Tamio Hirosawa, Odawara, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 963,944

Int. Cl.² F02M 19/06

U.S. Cl. 261—34 R **7 Claims**

1. A carburetor provided with a butterfly-shaped throttle valve, comprising a carburetor body including therein at least a suction bore having a horizontally extending venturi portion, a first hole extending vertically across said suction bore and opening in said venturi portion and a second hole arranged in

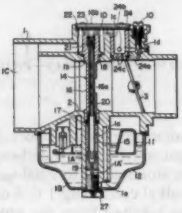
parallel with said first hole; a float chamber defined below said body; a main nozzle assembly screwed in said first hole from above said body and including therein at least a main air jet, a plurality of nozzles opening in said suction bore and a main jet capable of being positioned in said float chamber; a pilot air jet screwed in said second hole; and a cover plate secured removably to said body and capable of covering the upper portion of said main nozzle assembly and pilot air jet.

4. A carburetor provided with a butterfly-shaped throttle valve, comprising

a carburetor body including therein at least a suction bore having a horizontally extending venturi portion, a first hole extending vertically across said suction bore and opening in said venturi portion and a second hole arranged in parallel with said first hole and opening in said suction bore;

a float chamber defined below said body;

a nozzle tube having a lower end, an intermediate portion and an upper end portion, said nozzle tube inserted into



said first hole from above said body and capable of being sealably fitted within said first hole and including therein

a main jet capable of being positioned in said float chamber at the lower end,

at least one nozzle opening in said suction bore in the intermediate portion,

a main air jet in the upper end portion, and

a bleed pipe connected to said main air jet;

said nozzle tube having a means capable of determining a correct position of inserting said nozzle tube into said first hole in cooperation with said body;

a bottom cylindrical jet block having a bottom wall inserted into said second hole, capable of being sealably fitted within said second hole and having third holes communicated with said suction bore in the bottom wall; and

a cover plate secured removably to said body and capable of respectively holding said nozzle tube and jet block in respective predetermined positions within said first and second holes.

4,205,025

SYNTHETIC POLYMERIC FIBRIDS, FIBRID PRODUCTS AND PROCESS FOR THEIR PRODUCTION

John R. Hart; Donald W. Lare, both of Hamilton, Ohio, and James J. Nault, Appleton, Wis., assignors to Champion International Corporation, Stamford, Conn.

Filed Dec. 22, 1975, Ser. No. 643,501

Int. Cl.[2] B29C *23/00*

U.S. Cl. 264—14 **6 Claims**

1. A process for the production of synthetic paper pulp product comprising preparing an aqueous solution of naturally occurring or modified naturally occurring film forming polymer which has been treated to render it more hydrophobic, injecting said solution into a liquid organic precipitating medium miscible with water but in which said polymer is insoluble and which precipitating medium additionally contains an agent which will render the polymer more hydrophobic, and providing sufficient shear to precipitate said polymer in fibrid morphology.

4,205,026

RADIATION CURABLE POLYBORSILOXANE POLYMER COMPOSITION AND METHOD OF USING SAME TO PRODUCE THERMOSTABLE INSULATING MATERIALS

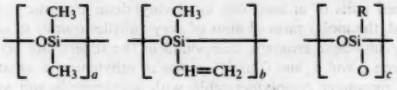
Isaak Y. Poddubny, Bulvar Novatorov 28, kv. 47; Sergei V. Averyanov, prospekt Narodnogo Opolchenia, 181, kv. 18; Lidia A. Averyanova, prospekt Narodnogo, Opolchenia, 181, kv. 18; Mark P. Grinblat, ulitsa Chernyshevskogo, 9, kv. 135, all of Leningrad; Rinat R. Safin, ulitsa Zhdanova, 1, kv. 99, Kazan; Alexandr K. Breger, ulitsa Polyarnaya, 10, kv. 131, Moscow; Vladimir A. Goldin, ulitsa Markhlevskogo, 11, kv. 147, Moscow; Elena Z. Branzburg, ulitsa Uralskaya, 6, korpus 2, kv. 29, Moscow; Viktor S. Kondratovsky, Pogonny proezd, 40, kv. 24, Moscow; Albert G. Kabirov, ulitsa Botanicheskaya, 13, kv. 87, Kazan; Alexandr T. Sanzharovsky, Leninsky prospekt, 99, korpus 3, kv. 186, Moscow; Valeria B. Shtukareva, Tishinskaya ploschad, 6, kv. 85, Moscow; Jury N. Svatikov, Buzheninovskaya ulitsa, 26/6, kv. 41, Moscow, and Nadezhda M. Stepanova, ulitsa Gastello, 41, kv. 78, Moscow, all of U.S.S.R.

Division of Ser. No. 760,027, Jan. 17, 1977, Pat. No. 4,151,158. This application Nov. 8, 1978, Ser. No. 958,789

Int. Cl.[2] B01D *47/00*; C08F *2/46, 30/08*

U.S. Cl. 264—22 **5 Claims**

1. A method for producing thermostable insulating materials, whereby a polymer composition, comprising 8 to 20 parts by weight of polyborsiloxane having a molecular weight of 2,000 to 5,000 and containing structural units. $BOSi\frac{}{}(CH_3)_2SiO\frac{}{}$ with a B:Si molar ratio of 1:4 to 5, 40 to 90 parts by weight of polysiloxane rubber, 10 to 60 parts by weight of an organic polymer selected from the group consisting of polyolefins, copolymers of olefins and dienes, halogenated polyolefins and halogenated copolymers of olefins and dienes, 2 to 10 parts by weight of branched polyorganosiloxane having a molecular weight of 2,000 to 5,000, of the general formula:



R is a radical selected from a group of radicals composed of CH_3 and C_6H_5, a=43 to 50 mole %, b=0 to 2 mole %, c=50 to 55 mole %, 10 to 25 parts by weight of silicon dioxide, and 5 to 10 parts by weight of a variable valency metal oxide, is molded on a substrate to produce a blank which is exposed to ionizing radiation to reach an absorbed radiation dose of 6 to 35 megarads.

4,205,027

METHOD OF THERMOFIXING CONTINUOUS COUPLING ELEMENTS OF SYNTHETIC-RESIN MONOFILAMENT FOR USE IN SLIDE-FASTENER STRINGERS

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Oct. 6, 1977, Ser. No. 839,906

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645454

Int. Cl.[2] B06B *3/00*

U.S. Cl. 264—23 **5 Claims**

1. A process for the thermal treatment of continuous coupling elements of synthetic-resin monofilament for use in a slide-fastener stringer, comprising the steps of:

introducing a succession of turns of synthetic-resin monofilament forming respective coupling members in the spaces between teeth of a support with a lower shank of each coupling member bearing against said support and an upper shank of each coupling member being disposed freely above said support;

heating said coupling members on said support to a thermofixing temperature; and

pressing the upper shank only of each member while applying ultrasonic energy thereto to depress each upper shank toward the respective lower shank and to simultaneously form a thread-receiving recess in the upper shank over only a limited portion of the length thereof while the upper shank is held at said temperature.

4,205,028

FORMING PROTECTIVE SKIN ON INTRICATELY MOLDED PRODUCT

Walter H. Brueggemann, Chagrin Falls, and John A. Brenner, Independence, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed Jan. 11, 1979, Ser. No. 2,658

Int. Cl.[2] B29C *5/00, 5/08;* **B29D** *9/00*

U.S. Cl. 264—24 **15 Claims**

1. A process for molding in a mold having relatively sharp bends and intricately curving, irregular surface contours a two-part bulk article comprising a sheet molding compound of relatively inferior physical properties, subject to exhibiting sink marks, porosity, waviness, pits, dimples, and the like after molding, defining the bulk of said article, and a resinous film of relatively superior physical properties, having little or no tears or film blemishes after molding, coating said sheet molding compound, said process comprising: coating the intricately curving, irregular surface contours of said mold while hot with particles of a partially cured, cross-linking polyester resin, substantially all of said particles containing within the particulate form said polyester resin, a catalytic amount of a peroxide catalyst, and a flow agent, causing said particles to fuse and bond from the heat of the mold and coalesce into a substantially continuous film coating said mold, said flow agent causing said polyester resin particles to flow along the mold after said fusing, filling the mold with a bulk, curable, organic sheet molding compound compatible with said polyester resin, and then heating the mold to cure said bulk fill resin to the shape of the mold and finally cure said polyester film while adhering the film to said molded bulk fill resin, said molded film having little or no tears or film blemishes in spite of the intricately curving irregular surface contours of the mold.

4,205,029

PRE-STRESSED CONCRETE CONSTRUCTION

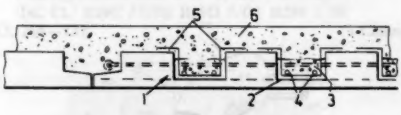
Esli J. Forrest, 54 Winetere Rd., Papatoetoe, Auckland, New Zealand

Continuation of Ser. No. 773,327, Mar. 1, 1977, abandoned, which is a continuation of Ser. No. 645,457, Dec. 30, 1975, abandoned, which is a continuation of Ser. No. 545,161, Jan. 29, 1975, abandoned. This application Jan. 5, 1978, Ser. No. 867,296

Claims priority, application Australia, Feb. 6, 1974, PB6480

Int. Cl.[2] B28B *23/04, 21/60*

U.S. Cl. 264—34 **4 Claims**



1. A method of forming a pre-stressed concrete member comprising:

forming a concrete shell with at least one inner trough;

curing said concrete shell sufficiently to permit the shell to withstand stress;

drying out at least the inner surface of said trough so as to temporarily arrest hydration therein;

locating at least one stressing member within said trough, in stress-application relationship therewith, and stressing said member so as to stress the shell;

dampening said inner surface of the trough;

infilling the trough with concrete so as to cover the stressed member; and

allowing the infilling concrete and the concrete shell to cure concurrently.

2. A method of forming a pre-stressed concrete member comprising:

forming a concrete shell with at least one inner trough;

applying a concrete setting retarding agent over inner surfaces of said trough(s);

curing said concrete shell sufficiently to permit the shell to withstand stress;

exposing the concrete of said inner surface of said trough;

drying out at least said inner surface of said trough so as to temporarily arrest hydration therein;

locating at least one stressing member within said trough, in stress-application relationship therewith, and stressing said member so as to stress the shell;

dampening said inner surface of the trough;

infilling the trough with concrete so as to cover the stressed member; and

allowing the infilling concrete and the concrete shell to cure concurrently.

4,205,030

METHOD FOR EXTRUSION OF HIGHLY VISCOUS THERMOSETTING MATERIAL

Vasily P. Menshutin, Proletarsky prospekt, 72, korpus 3, kv. 131; Modest S. Akutin, B. Tishinksy pereulok, 26, korpus 16, kv. 16, both of Moscow; Nikolai V. Iovdalsky, ulitsa Stepnaya, 45, Krasnodar; Alla N. Minakova, Komsomolsky bulvar, 46, kv. 171, Zhdanov; Evgeny R. Zherebtsov, poselok Tuchkovo, ulitsa Partizan, 31, kv. 101, Moskovskaya oblast, Ruzsky raion; Anatoly D. Sokolov, Molodezhnaya ulitsa, 4, kv. 109; Vsevolod V. Abramov, Poklonnaya ulitsa, 2, kv. 4, both of Moscow; Galina D. Melekhova, Pravolineinaya ulitsa, 26, Moskovskaya oblast, stantsia Bykovo, and Alexandr N. Ustkachkintsev, ulitsa Kozlova, 11, kv. 29, Moskovskaya oblast, Orekhove-Zuevo, all of U.S.S.R.

Filed May 15, 1978, Ser. No. 905,953

Int. Cl.[2] B29F *3/01;* **B29G** *2/00*

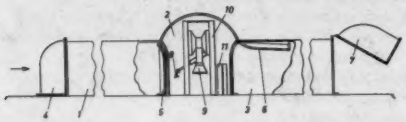
U.S. Cl. 264—40.1 **8 Claims**

1. A method for extrusion of a highly viscous thermosetting or thermoplastic resin material comprising determining the melt viscosity of a selected thermosetting resin material or melt index of a selected thermoplastic resin material and the ratio of internal and external friction values of said selected material; adding substances to said material to diminish the external friction of the selected material until said ratio is within the range of from 1.5 to 4.0 when said ratio of the selected material initially falls outside said range; in the case of a thermosetting resin material, adjusting the melt viscosity of the thermosetting resin material to a viscosity in the range of from 50×10^6 to 300×10^6 poises when said melt viscosity of the selected thermosetting resin material initially falls outside said range, in the case of a thermoplastic resin material adjusting the melt index of the selected thermoplastic resin material to a melt index in the range of from 0.1 to 0.01 g/10 min. when said melt index of the selected thermoplastic resin material initially falls outside said range and extruding the material at a rate in the range of 20 to 300 m/min.

4,205,031
METHOD OF PRODUCING LAMINATES OF REINFORCED OR NON-REINFORCED THERMOSETTING RESIN IN A LOW PRESSURE CHAMBER

Kent R. Almqvist, Box 5159, S-43400 Kungsbacka; Jan A. Christensen, Vallhamnsgatan 106, S-42166 Västra Frölunda, both of Sweden; Roar L. Alfheim, Idunsvei 12, N-3200 Sandefjord, and Lars Torgersen, Storängsveien 62 B, N-1320 Stabekk, both of Norway

Filed Jun. 2, 1977, Ser. No. 802,875
Claims priority, application Sweden, Jun. 10, 1976, 7606540
Int. Cl.[2] B29D *9/04*
U.S. Cl. 264—40.4 6 Claims



1. An improved method of manufacturing thermoset products such as products of fiberglass-reinforced polyester, by building up a laminate layer by spraying resin onto the wall of a mould with the use of spraying equipment, comprising the steps of positioning the mould in a chamber for performing said method in the chamber, maintaining said chamber at a partial vacuum, spraying the resin on the mould in the chamber while the partial vacuum is maintained, the entire equipment for performing said method enclosed inside chamber, spraying an airtight surface layer onto said laminate to prevent penetration of air, and subsequently exposing the mold, laminate and surface layer to atmospheric pressure for collapsing any pores and bubbles formed in said laminate during the process immediately upon exposure of said laminate to air at atmospheric pressure following said laminate build-up.

4,205,032
METHOD FOR PRODUCING RIGID ARTICLES OF REFRACTORY FIBERS

Ian R. Walters, Huddersfield, and Harold G. Emblem, Mirfield, both of England, assignors to Zirconal Processes Limited, Bromley, England

Continuation-in-part of Ser. No. 786,238, Apr. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 561,347, Mar. 24, 1975, Pat. No. 4,025,350, and Ser. No. 780,352, Mar. 23, 1977, Pat. No. 4,102,691. This application Feb. 12, 1979, Ser. No. 11,714
Claims priority, application United Kingdom, Mar. 28, 1974, 13834/74; Aug. 13, 1974, 35610/74
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.[2] C04B *35/64*
U.S. Cl. 264—63 3 Claims

1. A method of producing a rigid refractory article of refractory fibres comprising:

(a) impregnating an article of refractory fibres with an aqueous solution of a zirconium salt which when dissolved in water yields an aqueous solution that is acidic, a gellation-inducing agent, and a gellation-delaying agent; said gellation-inducing agent is selected from the group consisting of aminoalcohols, morpholine, dead burned magnesia powder and powdered magnesia-containing spinels and said gellation-delaying agent is selected from the group consisting of magnesium acetate, magnesium lactate, ammonium lactate, glycine, betaine, fructose and polyhydric alcohols; the amounts of the solution of zirconium salt, gellation-inducing agent and gellation-delaying agent is such that the article will rigidise on standing;

(b) forming the impregnated article to the desired shape;

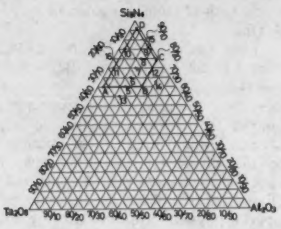
(c) allowing the impregnated article to set; and

(d) firing the impregnated article to form a rigid refractory article.

4,205,033
PROCESS FOR PRODUCING COMPACT SILICON NITRIDE CERAMICS

Yoshinori Hattori, and Tamotu Miyachi, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Aug. 22, 1978, Ser. No. 935,416
Claims priority, application Japan, Aug. 22, 1977, 52-100314
Int. Cl.[2] C04B *35/58*
U.S. Cl. 264—65 7 Claims



1. A process for producing a compact silicon nitride ceramic product which comprises molding a powder mixture of Si_3N_4, Ta_2O_5 and Al_2O_3 in the volume proportions defined by the region A, B, C and D in the FIGURE, the points A, B, C and D representing powder mixtures of the compositions, in volume percent, indicated below:

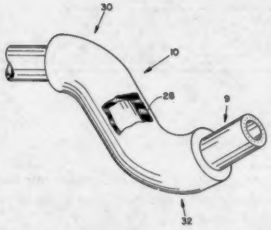
	Si_3N_4	Ta_2O_5	Al_2O_3
A	65.0%	32.0%	3.0%
B	65.0%	15.0%	20.0%
C	79.0%	1.0%	20.0%
D	96.0%	1.0%	3.0%

and then firing the powder mixture in a non-oxidizing atmosphere containing a carbon compound; or hot-pressing the powder mixture; in a graphite mold.

4,205,034
METHOD FOR MAKING A REINFORCED TUBULAR ARTICLE

Mark A. Newberry, Lakewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 583,068, Jun. 2, 1975. This application Aug. 8, 1977, Ser. No. 822,591
Int. Cl.[2] B29H *7/14;* B29C *17/02;* B29D *23/05*
U.S. Cl. 264—103 10 Claims



1. A method for forming a flexible curved tubular unitary article having a protective sleeve integral therewith, comprising:

forming an elongated tube defined by respective inner and outer surfaces and comprised of elastomeric material in an uncured state;

forming an elastomeric sleeve, separate of the tube, in an uncured state and shorter in length than the tube;

positioning the sleeve upon the outer surface of the tube at a desired location spaced from each end of the tube while each of the tube and sleeve are uncured;

said sleeve at said desired location defining the radial outermost portion of the hose;

applying radially outwardly directed pressure to the inner surface of the tube from internally within the tube to force the tube outwardly and apply pressure against the sleeve; and thereafter

curing the tube and sleeve together to form the curved unitary article whereby the tube and sleeve are integrally attached together and free from mutual slippage said outwardly directed pressure being supplied by positioning the tube and sleeve over a rigid curved mandrel having an outer diameter greater than the inner diameter of the tube.

4,205,035

COAL-CONTAINING SHAPED BODIES AND PROCESS FOR MAKING THE SAME

Carl Kröger, Aachen; Ingo Romey, and Georg Kölling, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Division of Ser. No. 649,920, Jan. 16, 1976, Pat. No. 4,113,817, which is a continuation of Ser. No. 461,738, Apr. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 238,519, Mar. 27, 1972, abandoned. This application Jun. 1, 1978, Ser. No. 911,702

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1971, 2116417; May 18, 1971, 2124555

The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.

Int. Cl.[2] C08L *7/00*

U.S. Cl. 264—120 **17 Claims**

1. A process for making shaped bodies by extrusion or injection molding, the bodies having the form of slabs, sheets, profiles, tubes, pipes or foils,

the said process comprising forming a mixture between (a) coal particles having a size of at most 200 microns and (b) about 10 to 30% by weight of thermoplastic polymer and copolymer,

and pressure-shaping said mixture by extrusion or injection molding to its final form at a temperature of about 100° to 250° C.

4,205,036

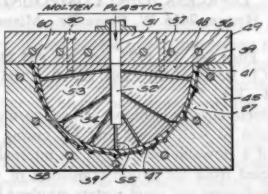
METHOD OF MAKING SIMULATED THREE-DIMENSIONAL STAINED GLASS OBJECTS

Charles E. Trame, Mequon, Wis., assignor to Everbrite Electric Signs, Inc., South Milwaukee, Wis.

Division of Ser. No. 871,302, Jan. 23, 1978, Pat. No. 4,110,393. This application Jun. 5, 1978, Ser. No. 912,661

Int. Cl.[2] B29C *17/00*; B29D *9/00*; B29F *1/00*

U.S. Cl. 264—132 **3 Claims**



1. A method for making generally non-planar contoured simulated stained glass articles composed of an array of simulated stained glass facets the majority of which are non-coplanar with respect to each other, said facets being bounded by simulated solder joints between them, said method comprising the steps of: coating a sheet of resin having a thickness in the range of 0.015 inch to 0.025 inch with materials which define an array of facets and bounding simulated solder joints having the colors desired in the finished article,

providing a first mold having a surface conforming generally with the contour of said article and said surface having planar areas arranged in correspondence with said facets and grooves arranged in correspondence with said joints and with a majority of said planar areas being non-coplanar with other said areas,

forming said resin sheet under the influence of heat and pressure to the contour of said first mold surface to conform said array of facets on said sheet with corresponding planar areas in said mold surface and to conform said joints on said sheet with corresponding grooves in said mold surface so that said joints are produced in relief, said resin sheet being generally concave on one side and substantially correspondingly convex on its other side after said forming,

disposing the concave and convex sheet produced in the preceding step in a second mold with the convex side of said sheet registering with a correspondingly concave surface in the second mold, said concave surface having planar areas and grooves corresponding with the planar areas and the relief joints on said concave and convex sheet for said relief joints and said planar areas on said concave and convex sheet to register accurately with said areas and grooves, respectively, on said second mold and, then injecting a layer of fluid resin material on a side of said concave and convex sheet opposite the side having said relief for said material to form a layer that is bonded to said concave and convex sheet to to produce a thick and rigid article when said resin material solidifies.

4,205,037

PROCESS FOR PRODUCING ACRYLIC SYNTHETIC FIBERS HAVING ANTI-PILLING PROPERTIES

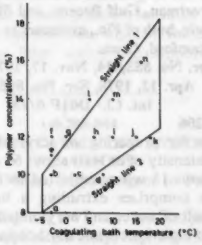
Masaaki Fujimatsu, Okayama, Japan, assignor to Japan Exlan Company Limited, Osaka, Japan

Filed Oct. 23, 1978, Ser. No. 953,535

Claims priority, application Japan, Nov. 16, 1977, 52-138219

Int. Cl.[2] D01D *5/10*

U.S. Cl. 264—182 **5 Claims**



1. A process for producing acrylic synthetic fibers having anti-pilling properties characterized by obtaining said acrylic synthetic fibers by unitary combination of the following process requirements (1) to (6) of:

(1) using an acrylic polymer containing combined therewith at least 85 weight % acrylonitrile,

(2) wet-spinning a spinning solution prepared from said polymer and stretching the thus-obtained spun fibers at a stretching ratio of 4–9 times,

(3) while adjusting the internal water content of the water-

swollen gel fibers after stretching to 50–130% based on the dry weight of the fiber-forming polymer,
(4) drying-compacting the stretched fibers in a tension-free state,
(5) subjecting the fibers to a secondary stretching step at a stretching ratio of 1.1–2.0 times in a wet-heat atmosphere above 100° C., and
(6) subjecting the fibers to a relaxing heat treatment at a temperature below 120° C.

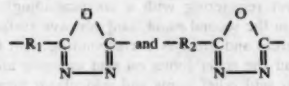
4,205,038

PROCESS FOR PRODUCING SHAPED ARTICLES OF POLYOXADIAZOLES

Donald L. Brydon, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 610,843, Sep. 5, 1975, Pat. No. 4,035,465. This application Dec. 9, 1976, Ser. No. 748,917
Int. Cl.² D01D *5/12*
U.S. Cl. 264—184 **12 Claims**

1. A method for the production of a drawn filament of polyphenylene-1,3,4-oxadiazole which comprises
(a) extruding through a shaped orifice a solution of the polymer in oleum or sulphuric acid, the polymer having as characteristic units



in which
R_1 is a p-phenylene radical, and
R_2 is a m-phenylene radical,
the ratio of R_1 radicals to R_2 radicals lying within the range 100/0 to 50/50, at least some of the phenylene radicals being bromine substituted in a position ortho to the heterocyclic ring, the bromine content of the polymer being at least T%/6 where T is the mole percent of p-phenylene radicals,
(b) passing the extruded polymer solution through a gaseous medium for a short distance, and then into an aqueous coagulant to form an undrawn, filament of the polymer,
(c) and stretching the undrawn filament at least six times its length, the filament being stretched at least two times while heated to a temperature of at least 350° C.

4,205,039

PROCESS FOR MELT-SPINNING ACRYLONITRILE POLYMER FIBER

William E. Streetman, Gulf Breeze, and Shashikumar H. Daftary, Pensacola, both of Fla., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 853,014, Nov. 17, 1977. This application Apr. 12, 1978, Ser. No. 895,576
Int. Cl.² D01F *6/18*
U.S. Cl. 264—206 **6 Claims**

1. A process for preparing an acrylonitrile polymer fiber having a dye intensity of at least about 60 and a shade change of less than about 15 when subjected to hot-wet processing, which process comprises extruding a homogeneous single phase fusion melt of water and acrylonitrile polymer containing hydrophilic moieties chemically bonded therein through a spinnerette, the amount of water in said melt being in the lower half of the range of amounts required to provide a single phase fusion melt under the conditions of extrusion and the amount of hydrophilic moieties contained in said polymer being sufficient to control the rate of release of water from the nascent extrudate in conjunction with processing and prevent substantial formation of a separate water phase; passing said nascent extrudate directly into a steam-pressurized solidification zone maintained under conditions of saturation and pressure to provide a solidified nascent extrudate and to prevent the substantial formation of a separate water phase in the solidified exrudate while removing water from said extrudate; releasing the solidified extrudate from said steam-pressurized solidification zone into the atmosphere to provide a solidified extrudate containing residual water in a single water-polymer phase; and drying the resulting extrudate under conditions of temperature and humidity indicated by a dry bulb temperature in the range of about 120°–180° C. and a wet bulb temperature in the range of about 60°–100° C. to remove water therefrom and to avoid the substantial formation of a separate water phase therein.

4,205,040

EXPOSED AGGREGATE FINISHING METHOD FOR CONCRETE

Tsuyoshi Aoyama, Hoya; Yoshimasa Hayashi, Tokyo; Hirotaka Toba, Yokohama; Akira Yoshida, Himji; Kenji Goto, Kawanishi, and Motoaki Kawakama, Chiba, all of Japan, assignors to Ohbayashi-Gumi, Ltd.; Daicel Ltd. and Fujisawa Pharmaceutical Co., Ltd., all of Osaka, Japan

Filed Oct. 22, 1975, Ser. No. 624,833
Claims priority, application Japan, Oct. 22, 1974, 49/121790
Int. Cl.² B28B *11/22*
U.S. Cl. 264—233 **3 Claims**

1. An exposed aggregate finishing method for concrete which comprises coating the inside faces of a form for concrete with a mixture of a cement setting retarder and a synthetic organic polymer coating material which is soluble in an aqueous alkaline solution of cement, but insoluble in water, and drying the coated faces and then placing concrete into said concrete form, removing the form and washing the surface of the molded concrete to make the surface rough; the organic polymer being a copolymer of an organic compound having unsaturated groups selected from the group consisting of methyl methacrylate, vinyl acetate, vinyl chloride, ethylene, propylene and styrene, and an organic acid having unsaturated groups and selected from the group consisting of acrylic acid, crotonic acid and maleic acid.

2. An exposed aggregate finishing method for concrete which comprises coating the inside faces of a form for concrete with a cement setting retarder; drying; coating the said dried faces with a synthetic organic polymer coating material which is soluble in an aqueous alkaline solution of cement, but is insoluble in water; and drying the coated faces and then placing concrete into said concrete form, removing the form and washing the surface of the molded concrete to make the surface rough; the organic polymer being a copolymer of an organic compound having unsaturated groups selected from the group consisting of methyl methacrylate, vinyl acetate, vinyl chloride, ethylene, propylene and styrene, and an organic acid having unsaturated groups and selected from the group consisting of acrylic acid, crotonic acid and maleic acid.

4,205,041

TAPELESS JOINT COMPOUND

Richard H. Hymes, 7416 W. Shore Dr., Minneapolis, Minn. 55435

Filed Sep. 19, 1977, Ser. No. 834,284
Int. Cl.² B32B *31/06*; C08L *23/08, 27/06, 31/04*
U.S. Cl. 264—261 **5 Claims**

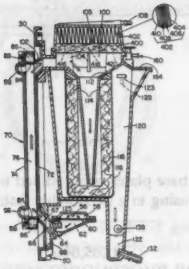
1. An ambient curable cohesive self-supporting formulation for application to wall panels and for curing thereon, and consisting of a flowable mixture of an internally plasticized binder selected from the group consisting of vinyl acetate-ethylene copolymers and vinyl acetate-ethylene-vinyl chloride interpolymers together with inert fillers and water, with said binder solids comprising between about 2% and 13% by total weight of the formulation.

4,205,042

BLOOD OXYGENATOR WITH A GAS FILTER

Donn D. Lobdell, Golden; Stephen J. Herman, Evergreen, and Joel F. Giurtino, Littleton, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 23, 1978, Ser. No. 918,359
Int. Cl.[2] A61M 1/03
U.S. Cl. 422—47 1 Claim



1. A blood oxygenator comprising:

a venous blood inlet chamber comprised of a first plastic housing and a venous blood inlet means connected thereto,

bubble generating means for forming oxygen bubbles in the blood in said blood inlet chamber, said means including a porous member positioned along one wall of said inlet chamber,

a gas exchange column means extending upwardly above said blood inlet chamber for transporting said bubbles while gas is exchanged with the blood, said column comprising a second plastic housing fastened to said housing forming said blood inlet chamber,

defoaming means connected to and communicating with the outlet of said gas exchange means for breaking up said bubbles,

blood reservoir means connected to and below said defoaming means for collecting oxygenated blood, said reservoir means and defoaming means comprising a third plastic housing fastened to said exchange column, and

oxygen filtering means, comprising

a fourth plastic housing fastened to at least one of said other plastic housings, said fourth housing comprising upper and lower plastic members each with mating flanges,

an oxygen inlet means secured to said upper member for introduction of oxygen into said fourth housing, oxygen outlet means secured to said lower member, and

a filter element in the form of a sheet of hydrophobic material, the thickness of said sheet being substantially less than the transverse dimensions of said sheet, said sheet being positioned completely above said porous member of said bubble generating means to allow for gravity return through said porous member of said bubble generating means and away from the surface of said filter of blood or priming solution accidentally ingested through said porous member of said bubble generating means during a loss of oxygen flow and bonded at its periphery between said mating flanges of said upper and lower members, thereby dividing said housing into upper and lower chambers,

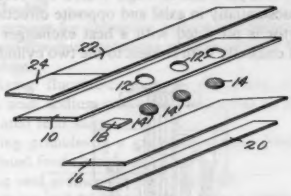
said oxygen outlet means being connected to and communicating with said porous member of said bubble generating means.

4,205,043

HAZARDOUS ATMOSPHERE BADGE

Victor H. Esch, 10717 Stanmore Dr., Potomac, Md. 20854, and Robert M. Fristrom, 10610 Mantz Rd., Silver Spring, Md. 20403

Filed May 4, 1978, Ser. No. 902,963
Int. Cl.[2] G01N 31/22; A62C 39/02
U.S. Cl. 422—56 5 Claims



1. Apparatus for indicating hazardous atmospheric conditions in a firefighting environment, consisting essentially of

a substantially planar indicating assembly including a substrate having front and back surfaces, and having a plurality of apertures therein; a plurality of gas indicator elements, corresponding in number to the number of apertures in said substrate, each for indicating by color change the presence of respective predetermined time and concentration exposures to a gas, said gas indicator elements being of greater dimensions than said substrate strip apertures; backing means, adherent to said back surface of said substrate, for maintaining said indicator elements in aligned relationship with said substrate apertures; and a strip of pressure sensitive tape adhering to said front surface of said substrate for maintaining said indicator elements in a condition wherein they are not exposed to said hazardous atmospheric conditions, and so that upon removal of said tape said indicator elements are exposed to said hazardous atmospheric conditions, said tape having a non-adhesive pull tab at one end thereof; and

means for attaching said indicating assembly to a user for use in detecting hazardous atmospheric conditions during firefighting, so that said pressure sensitive tape may be readily removed from said substrate while said indicating assembly remains attached to the user, said attaching means comprising a clip having elongated edges supporting edges of said substrate, and supporting clip loops extending from one end of each of said elongated edges for engaging an article of clothing of the user, said non-adhesive pull tab of said pressure sensitive tape extending from an end of said substrate adjacent the ends of said clip elongated edges from which said supporting clip loops extend.

4,205,044

REACTOR FOR CATALYZED EXOTHERMIC REACTIONS

Giorgio Gramatica, Milan, Italy, assignor to Tecnimont S.p.A., Milan, Italy

Filed Sep. 20, 1977, Ser. No. 835,005
Claims priority, application Italy, Sep. 24, 1976, 27626 A/76
Int. Cl.[2] B01J 8/04
U.S. Cl. 422—191 1 Claim

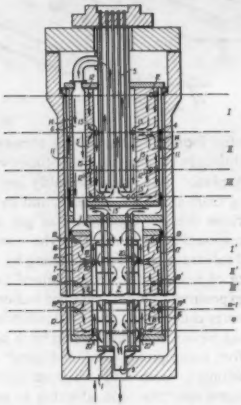
1. A catalytic reactor for catalyzed exothermic reactions having two catalyst layers, lying one over the other, wherein each of said two catalyst layers is contained within two coaxial cylindrical shells, said shells being provided with inlets to and outlets from said catalyst layer for reacting gases, each of said inlets and outlets consisting essentially of a plurality of openings in said cylindrical shells aligned on circumferences of said cylindrical shells defined by the intersections of said cylindrical shells with planes equi-

spaced from one another and perpendicular with respect to the axis of said cylindrical shells, wherein

the distance between two of said equispaced and perpendicular planes, one of which defines an inlet and the other an adjacent outlet, is between 1000 and 4000 mm, and

at least one of said inlets is in a median position with respect to an adjacent pair of outlets, and the portion of catalyst layer bounded by the planes of said adjacent outlets defines a catalyst zone through which the reacting gases flow substantially in axial and opposite directions,

said reactor is provided with a heat exchanger means arranged coaxially with respect to the two cylindrical shells



defining the lower catalyst layer and positioned inside the internal cylindrical shell thereof,

said reactor is provided with a boiler means for steam generation arranged coaxially with respect to the two cylindrical shells of the upper catalyst layer and positioned inside the internal cylindrical shell thereof, and

reaction gas feed means communicating with said heat exchanger means such that reacting gases fed to the reactor are pre-heated in said heat exchanger, passed through said upper catalyst layer, cooled in said boiler, passed through said lower catalyst layer, and finally cooled in said heat exchanger.

4,205,045

RADIAL-FLOW REACTOR WITH HEATABLE CATALYST FILLING

Helmut Westernacher, Haltern; Peter Schimpff, and Ferdinand Botthof, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Fed. Rep. of Germany

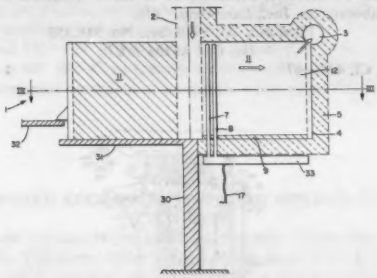
Filed Mar. 21, 1978, Ser. No. 888,746

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712371

Int. Cl.[2] B01J *8/02*

U.S. Cl. 422—192 **13 Claims**

1. A radial-flow reactor for effecting endothermic, catalytic reactions, which comprises a closed reactor housing, having a reactor chamber therein, a centrally arranged, inlet duct for introducing gaseous reactants radially into said reactor chamber, a catalyst bed disposed around the inlet duct and located within said chamber, and at least one outlet duct arranged on an outer rim of the housing containing the catalyst bed, for removing gaseous material from said reactor chamber, a plurality of heating elements embedded in the catalyst bed, said heating elements being constructed as straight electrically heated heating tubes each projecting with one free end into the reactor chamber and being attached with the other end to a base plate, a plurality of base plates forming part of a wall structure defining the reactor chamber and forming said reac-



tor housing, said base plates being joined to the wall structure of the reactor housing in a detachable fashion.

4,205,046

REACTOR FOR PHOSPHORIC ACID PRODUCTION

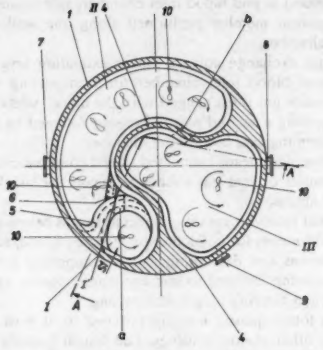
Neculai Popovici, Bucharest, Romania, assignor to Institutul de Inginerie Tehnologica Si Proiectare Pentru Industria Chimica, Bucharest, Romania

Filed Sep. 6, 1978, Ser. No. 940,147

Claims priority, application Romania, Jan. 18, 1978, 92938

Int. Cl.[2] F01C *1/08, 1/00*

U.S. Cl. 422—193 **1 Claim**



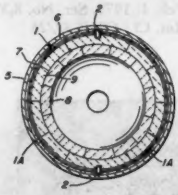
1. A reactor for the manufacture of phosphoric acid by the wet process starting with natural phosphate and sulphuric acid, comprising a circular cylindrical tank of which a lateral circular wall together with a sinusoidal vertical wall, a circular vertical wall and another vertical wall delimit inside the reactor a first compartment for the pre-mixing of reactants, a second overflowing compartment, a third compartment for the completion of the natural phosphate decomposition, and a fourth, final compartment in which the crystallization process of calcium sulphate is taken to completion, the first, pre-mixing compartment and the second, overflowing compartment communicating with each other by means defining a hole situated in the circular vertical wall bottom side, the third and fourth compartments communicating through means defining a hole in the sinusoidal vertical lower side, all the compartments providing both the pre-mixing of reactives and the reaction proper, the sinusoidal wall promoting simply by its configuration the guiding of the stream of reagents whose forward movement is adjusted according to the requirements of each phase of the reaction process: pre-mixing, decomposition, crystal formation and crystal growth.

4,205,047

TUBULAR APPARATUS FOR CONDUCTING GASES

Heinz Thubeauville, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,059
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705981
Int. Cl.[2] B01J *3/04;* F27D *1/00*
U.S. Cl. 422—242 10 Claims



1. A tubular apparatus for conducting gases under a high pressure and at an elevated temperature, said tubular apparatus including the combination of:

a lining of refractory brick adapted to undergo stressing to form a gas-impervious seal while conducting gases under a high pressure and elevated temperature,

an inner cylindrical shell assembly surrounding the outer surface of said lining of refractory brick, said inner cylindrical shell assembly including an elongated metal cylinder having the wall thereof divided along at least one longitudinal parting line and a stress compensator member extending along said parting line between the parted wall edge surfaces in the elongated metal cylinder to maintain said lining of refractory brick under stress by resisting forces imposed on the refractory brick due to the high pressure of the gases at an elevated temperature,

an outer cylindrical metal shell to receive and support therein said inner cylindrical shell assembly and constrain the stress compensator member thereof, and

conduit means to pass gases under a high pressure and elevated temperature along said lining of refractory brick.

4,205,048

LIQUID-LIQUID EXTRACTION OF CU, CO, NI FROM AMMONIACAL SOLUTIONS WITH 7-ETHYL-UNDECA-2,4-DIONE

Jai H. Kyung, and Harvey J. Richards, both of Columbus, Ohio, assignors to Sherex Chemical Company, Inc., Columbus, Ohio

Continuation of Ser. No. 867,660, Jan. 9, 1978, abandoned. This application Feb. 8, 1979, Ser. No. 10,354
Int. Cl.[2] C01G *3/00, 51/00, 53/00;* C07C *49/12*
U.S. Cl. 423—24 1 Claim

1. In a liquid-liquid ion exchange process for the recovery of copper, cobalt or nickel values from a dilute ammoniacal solution thereof whereby said ammoniacal solution is contacted with an organic solution of a metal chelating agent to effect transfer of said metal values to the organic phase and whereupon the metal-loaded organic phase is then separated and contacted with an aqueous solution of a strong acid to effect transfer of the metal values to said aqueous acid phase from whence the metal values are recovered; the improvement wherein the metal chelating agent is 7-ethyl-undeca-2,4-dione.

4,205,049

WATER INJECTION FOR CONTROL OF FINES FOR PRODUCING DEFLUORINATED PHOSPHATE ROCK GRANULES

Ronald J. Smith, Friendswood, and Manuel A. Gonzalez, Houston, both of Tex., assignors to Olin Corporation, New Haven, Conn.

Filed May 31, 1977, Ser. No. 801,883
Int. Cl.[2] C01F *1/00, 5/00, 11/00*
U.S. Cl. 423—167 8 Claims

1. In the process for preparing defluorinated phosphate rock granules from fluorine-containing phosphate rock which comprises the steps:

(a) admixing fluorine-containing phosphate rock, phosphoric acid, sodium carbonate, and water to form a non-granulated feed slurry;

(b) forming granules in a granulation zone from said non-granulated feed slurry;

(c) drying said granules in a drying zone;

(d) classifying said dried granules to form a product fraction, an over-size fraction, and a fines fraction of said granules;

(e) crushing said over-size fraction and recycling said crushed over-size fraction, said fines fraction and from 0% to about 95% by weight of said product fraction back to step (b);

(f) heating the unrecycled product fraction to defluorinate said fluorine-containing phosphate rock contained therein without fusion;

(g) recovering said defluorinated phosphate rock granules; and

(h) wherein more than about 20% by weight of said dried granules discharged from said drying zone are less than about 20 mesh in size,

the improvement which comprises:

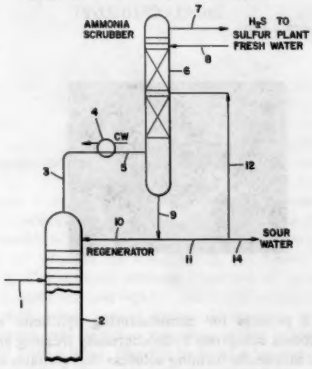
adding an aqueous solution to said granulation zone in a proportion equivalent to from about 5% to about 30% by volume of said non-granulated feed slurry fed to said granulation zone.

4,205,050

METHOD OF REDUCING CORROSION IN SOUR GAS SWEETENING SYSTEMS

Robert L. Piehl, Napa, and W. Bertram Scarborough, Lafayette, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 17, 1976, Ser. No. 697,073
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—228 3 Claims



1. In a process for the recovery of hydrogen sulfide from a gaseous mixture containing ammonia and said sulfide by contacting the mixture with an aqueous alkanolamine solution and

recovering said hydrogen sulfide by passing the resulting hydrogen-sulfide-rich aqueous alkylolamine to an alkanolamine regenerating column operating under aqueous alkanolamine solution reflux conditions and withdrawing an overhead hydrogen-sulfide-rich stream from the overhead section of said regenerating column, the improvement comprising reducing corrosion in said section by steps including:

(i) passing said withdrawn overhead regenerating column stream to an ammonia scrubber column operating under ammonia scrubbing conditions;

(ii) withdrawing an overhead stream comprising hydrogen sulfide from said scrubber column;

(iii) withdrawing a bottoms stream comprising water from said scrubber column; and

(iv) introducing a portion of said withdrawn bottoms stream into said overhead section of said regenerating column, said portion based upon the bottoms effluent from said scrubber column, being in the range from about 20 to 70 percent thereof.

4,205,051

STABILIZED ZIRCONIA FOR OXYGEN ION-CONDUCTIVE SOLID ELECTROLYTE

Takehiko Takahashi, and Yutaka Suzuki, both of Nagoya, Japan, assignors to Toyota Jidosha Kogyo Kabushika Kaisha, Toyota, Japan

Filed Aug. 14, 1978, Ser. No. 933,478
Claims priority, application Japan, Oct. 15, 1977, 52-123896
Int. Cl.[2] C01G *25/02*
U.S. Cl. 423—266 **3 Claims**

1. Stabilized zirconia for an oxygen ion-conductive solid electrolyte, comprising zirconium oxide containing scandium oxide and ytterbium oxide having the formula:

$$\alpha ZrO_2 \cdot \beta Sc_2O_3 \cdot \gamma Yb_2O_3$$

wherein α, β, γ are molar fractions; and $\alpha+\beta+\gamma=1$, and the molar fractions α, β, γ are in the following ranges:

$0.86<\alpha<0.94$
$0<\beta<0.14$
$0<\gamma<0.14$.

4,205,052

MANUFACTURE OF SYNTHETIC MORDENITE

Louis D. Rollmann, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1979, Ser. No. 8,368
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—329 **6 Claims**

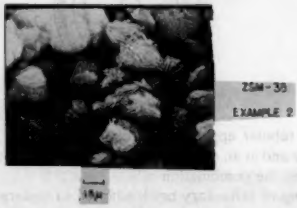
1. In a process for manufacturing synthetic mordenite, which process comprises hydrothermally treating an aqueous, inorganic mordenite forming solution that contains a source of SiO_2 whereby forming substantially pure synthetic mordenite having a characteristic microscopic texture, the improvement which comprises adding to said forming solution an amount of substantially colorless organic basic nitrogen compound, said amount being effective to alter said microscopic texture of said substantially pure mordenite.

4,205,053

MANUFACTURE OF NITROGENOUS ZEOLITES

Louis D. Rollmann, Princeton, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 1, 1979, Ser. No. 8,374
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—329 **11 Claims**



1. In a process for manufacturing a synthetic zeolite having a silica to alumina ratio of at least about 12 and a characteristic microscopic texture, which process comprises crystallizing an aqueous forming solution comprising a source of SiO_2 and a nitrogenous template, and recovering said synthetic zeolite, the improvement which comprises adding to said forming solution an amount of substantially colorless organic basic nitrogen compound selected from the group consisting of quaternary ammonium compounds having not more than three methyl, three ethyl or three propyl substituents, and amines, said basic nitrogen compound having a chemical structure different from said template, and said amount being effective to alter said microscopic texture.

4,205,054

PROCESS FOR RECOVERY OF NITRIC ACID FROM NITRATES

Yujiro Sugahara, Tokyo; Hiroyuki Naito, Tsuruoka; Kiyoshi Takai, Tsuruoka, and Tatuya Kondo, Tsuruoka, all of Japan, assignors to Mizusawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 28, 1978, Ser. No. 890,910
Claims priority, application Japan, Mar. 28, 1977, 52/33279
Int. Cl.[2] C01B *21/42*
U.S. Cl. 423—390 **10 Claims**

1. A process for recovery of nitric acid comprising mixing an aqueous solution containing nitric acid and/or a nitrate with a dry powder of an oil-absorbing inorganic carrier having an oil-absorbing capacity of at least 20 ml/100 g and being selected from the group consisting of oxides, hydroxides, carbonates and silicates of polyvalent metals and silica with the proviso that when the aqueous solution contains only nitrate said inorganic carrier may be silica, to form a nitrate-carrier granule containing the carrier in an amount of 40 to 250 percent by weight as calculated as the oxide based on the anhydrous nitrate and water in the form of a hydroxide, a hydrate or adsorption moisture in an amount of 2.18 to 8.6 moles per mole of the nitric acid radical (NO_3) in the nitrate, heating the formed granule while keeping the substantially non-sticky state in the granule to decompose the nitrate in the granule to a vapor of nitric acid, and recovering the generated vapor of nitric acid.

4,205,055

DUAL PORE-STRUCTURE ARTIFICIAL CARBON AND GRAPHITE

Jacques Maire, Epinay sur Seine; Jacques Fourre, Soisy sous Montmorency, and Jean P. Gervais, Noisy le Sec, all of France, assignors to Le Carbone-Lorraine, Paris, France

Filed May 8, 1978, Ser. No. 903,915
Claims priority, application France, May 12, 1977, 77 14581
Int. Cl.[2] C01B *31/02, 31/04*
U.S. Cl. 423—445 9 Claims

1. An artificial dual pore-structured carbon or graphite which is suitable for use as a catalyst substrate or an electrode material consisting essentially of a macro-porous agglomeration of strongly bonded microporous grains of carbon or graphite, the radius of the macropores being from substantially 10 to 350 μm and that of the micropores being substantially 0.2 to 1.0 μm, said macropores being joined by intercommunicating channels thus forming a fluid permeable structure, said carbon or graphite having a density of from 0.70 to 1.50 gms/cc., a permeability to gases of from 20 to 500 cm^2/sec/atmos, and a porosity of from 30 to 50%.

2. A process for the production of an artificial dual pore-structured carbon suitable for use as a catalyst substrate or an electrode material consisting essentially of a macroporous agglomeration of strongly bonded microporous grains of carbon which process comprises preparing an aggregate of (a) 15–35% by weight of tar or pitch and (b) 85–65% by weight of a finely divided carbonaceous material having a particle size up to 100 microns, intimately admixing the resulting aggregate with a particulate, eliminable, non-carbon forming material which material is substantially insoluble in said aggregate, shaping the resulting product is desired shape by compression or extrusion, heating the resulting shaped product to a carbonisation temperature for a time sufficient to carbonize the pitch content thereof, cooling the carbonized shaped material and, when a residue of said particulate material is present in the cooled carbonaceous product, treating said cooled product to remove said residue therefrom, said particulate eliminable material being used in the form of particles which will produce macropores having a radius of 10 to 350 μm in the ultimate product and in such a proportion that the resulting artificial carbon will have a density of from 0.70 to 1.50, a permeability to gases of from 20 to 500 cm^3/sec/atmos and a porosity of 30 to 50%.

4,205,056

PROCESS FOR ORTHO-PARA-HYDROGEN CONVERSION

Hiroo Inokuchi, Okazaki; Kentaro Murano, Ibaraki; Hiroshi Kawazura, Kamifukuoka, and Tsutomu Kobayashi, Ibaraki, all of Japan, assignors to Japan Synthetic Rubber Company, Limited, Tokyo, Japan

Continuation of Ser. No. 843,600, Oct. 19, 1977, abandoned, which is a continuation of Ser. No. 756,696, Jan. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 552,203, Feb. 24, 1975, abandoned. This application Apr. 11, 1979, Ser. No. 28,990
Claims priority, application Japan, Feb. 26, 1974, 49-21983
Int. Cl.[2] C01B *1/00*
U.S. Cl. 423—649 8 Claims

1. In a process for the ortho-para conversion of hydrogen wherein hydrogen is contacted with a catalyst at the desired conversion temperature, the improvement which comprises said catalyst being a sulphur-containing semiconductive polymer produced by dehalogenating a poly(tetrahalophenylene sulphide) in the presence or absence of an organic solvent at a temperature from 150° to 500° C.

4,205,057

CEREBROSPINAL FLUID PROTEIN FRAGMENTS

John N. Whitaker, Memphis, Tenn., assignor to Government of the United States, Washington, D.C.

Filed Jan. 17, 1978, Ser. No. 870,090
Int. Cl.[2] G01N *33/16;* A61K *43/00*
U.S. Cl. 424—1 3 Claims

1. In a method for detecting an acute phase of multiple sclerosis in a patient, the improvement which comprises subjecting the cerebrospinal fluid of said patient to a double antibody radioimmunoassay procedure to determine the presence therein of a fragment of encephalitogenic protein (EP) containing residues 43–88, said fragment being designated EP-P1, said radioimmunoassay procedure comprising forming a radioimmunoassay reaction mixture containing said cerebrospinal fluid, rabbit anti-EP serum, and ^{125}I-EP-P1 to produce a radioactive product including the reaction product of said anti-EP serum and said ^{125}I-EP-P1, adding a second antibody to precipitate said radioactive product, and measuring the radioactivity of said precipitated radioactive product from which the presence of the EP-P1 fragment is determined.

4,205,058

COLUMN CHROMATOGRAPHY SPECIFIC BINDING ASSAY METHOD AND TEST KIT

Daniel B. Wagner; Anthony J. Pick, and Judith Feingers, all of Jerusalem, Israel, assignors to Ames-Yissum, Ltd., Jerusalem, Israel

Filed Nov. 16, 1977, Ser. No. 852,105
Claims priority, application Israel, Jan. 28, 1977, 51354
Int. Cl.[2] G01N *33/16;* A61K *43/00;* B65D *81/32*
U.S. Cl. 424—1 44 Claims

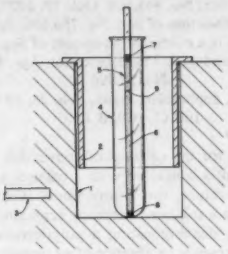
1. In a specific binding assay method for determining a ligand in or the ligand binding capacity of a liquid medium,

wherein for determining said ligand, said liquid medium is combined with assay reagent means comprising (i) as labeled component, said ligand or a binding analog thereof incorporated with a label and (ii) a binding reagent for said ligand; or wherein for determining the ligand binding capacity of said liquid medium suspected of containing a binding agent for said ligand, said liquid medium is combined with assay reagent means comprising, as labeled component, said ligand or a binding analog thereof incorporated with a label, thereby to form a binding reaction mixture having a bound-species as said labeled component bound to said binding reagent and a free-species as said labeled component not bound to said binding agent,

wherein said bound-species and said free-species are separated, and

wherein said label is measured in one of the separated species;

the improvement which comprises accomplishing said separation of said bound-species and said free-species by contacting at least a portion of said binding reaction mixture, a predetermined time after formation thereof, with a column comprising an adsorbent material which is both selective for binding one of said bound-species and said free-species and capillarily absorbent relative to said reaction mixture whereby said at least a portion of said reaction mixture is drawn into said column by capillary action and said bound-species and said free-species are separated along said column.



4,205,059

ANIMAL AND VEGETAL TISSUES PERMANENTLY PRESERVED BY SYNTHETIC RESIN IMPREGNATION

Günther von Hagens, Jahnstrasse 8, D-6900 Heidelberg, Fed. Rep. of Germany

Filed Nov. 14, 1977, Ser. No. 851,101

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710147; May 7, 1977, 2720607

Int. Cl.[2] A01G *5/06*

U.S. Cl. 427—4 **15 Claims**

1. A method of preparing a body consisting essentially of anhydrous animal or vegetal tissue and a water-insoluble synthetic resin substantially uniformly distributed in said tissue which comprises:

(a) replacing the water content of a water-bearing body of animal or vegetal tissue with an organic solvent volatile in a vacuum at ambient temperature;

(b) holding said body bearing said solvent in contact with a fluid precursor composition in a vacuum and at said temperature until said solvent is volatilized and replaced in said body by said composition, said composition being capable of being polymerized into a solid, water-insoluble, synthetic resin;

(c) removing adhering precursor composition from the surface of said body; and

(d) holding said body under polymerization conditions until said precursor composition in said body is cured to said solid resin.

4,205,060

MICROCAPSULES CONTAINING MEDICAMENT-POLYMER SALT HAVING A WATER-INSOLUBLE POLYMER SHEATH, THEIR PRODUCTION AND THEIR USE

Harold G. Monsimer, Norristown, and Howard A. Bohm, Harleysville, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 20, 1978, Ser. No. 971,243

Int. Cl.[2] A61K *9/50*

U.S. Cl. 424—14 **5 Claims**

1. Microcapsules comprising a core containing a water-soluble salt formed from a medicament and a water-soluble polymer, and a sheath of a water-insoluble film forming polymer wherein said salt is selected from one member of the group consisting of (1) a salt of a medicament which contains at least one basic group and a water-soluble polymer which contains at least one acid group and (2) a salt of a medicament which contains at least one acid group and a water-soluble polymer which contains at least one basic group; said microcapsules having an average particle size from about 0.5 to 50 microns.

4,205,061

ORAL ANTIMICROBIAL COMPOSITIONS

James D. Vidra, Clinton, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 14, 1978, Ser. No. 924,764

Int. Cl.[2] A61K *7/24, 31/44, 31/60, 31/625*

U.S. Cl. 424—55 **5 Claims**

1. An oral antimicrobial composition comprising as the active antimicrobial ingredients a synergistic combination of 3,5-dibromo-3'-trifluoromethylsalicylanilide and cetylpyridinium chloride wherein the 3,5-dibromo-3'-trifluoromethylsalicylanilide and cetylpyridinium chloride are present in a ratio of from about 10:1 to about 1:10.

4,205,062

PERSPIRATION-INHIBITING SOAPS

Gähn Dähahn, Holzminden, Fed. Rep. of Germany, assignor to Bayer Atkiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 30, 1975, Ser. No. 573,213

Claims priority, application Fed. Rep. of Germany, May 11, 1974, 2422903

Int. Cl.[2] A61K *7/34, 7/36, 7/38*

U.S. Cl. 424—66 **4 Claims**

1. A perspiration-inhibiting soap comprising by weight

(a) 40 to 70% of a synthetic washing-active material;

(b) 10 to 30% of a builder;

(c) 10 to 30% of a perspiration-inhibiting agent of the group consisting of an aluminum salt, a zinc salt, a zirconium salt and a salt of a rare earth element; and

(d) 5 to 35% of other soap additives known per se.

4,205,063

LOW IRRITANT CONDITIONING SHAMPOO COMPOSITION

Ezzat N. Khalil, Oak Park, and Ali N. Syed, Hazelcrest, both of Ill., assignors to Johnson Products Co., Inc., Chicago, Ill.

Filed Apr. 12, 1979, Ser. No. 29,382

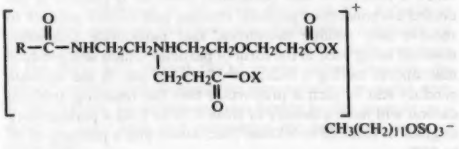
Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—70 **7 Claims**

1. A conditioning, detangling hair shampoo composition with low eye irritancy having a pH of about 6.0 to about 7.0 comprising water having dispersed therein a hair conditioning complex consisting essentially of:

(A) a water-soluble cationic cellulose ether derivative having a chain of anhydroglucose units with substituent groups pendant therefrom and spaced along said chain, said cellulose ether derivative containing a plurality of quaternary nitrogen-containing groups having from zero to 3 moles of quaternary nitrogen-containing groups per anhydroglucose unit, said cellulose ether derivative having an average molecular weight of about 10,000 to about 4,000,000, and

(B) an amphoteric surfactant of the formula



where

is selected from the group consisting of saturated fatty acids containing twelve to eighteen carbon atoms and unsaturated fatty acids containing twelve to eighteen carbon atoms, and X is an alkali metal cation; said cationic cellulose derivative being present in the composition at about 0.25 to about 2.5 weight percent and said amphoteric surfactant being present in the composition at about 5 to about 12 weight percent; said complex being dispersed by a mixture of nonionic surfactants consisting essentially of:

(C) about 1 to about 10 weight percent fatty acid N,N-diethanolamide wherein the fatty acid contains twelve to eighteen carbon atoms, and

(D) about 0.5 to about 7 weight percent polyoxyethylene sorbitan fatty acid ester, said ester being selected from the group consisting of a polyoxyethylene sorbitan fatty acid monoester wherein the fatty acid of said monoester contains twelve to eighteen carbon atoms and a polyoxyethylene sorbitan fatty acid triester wherein the fatty acid of said triester contains twelve to eighteen carbon atoms; all of said weight percentages being based upon the total weight of said shampoo composition.

4,205,064

BILE ACID SEQUESTERING COMPOSITION CONTAINING POLY[{ALKYL-(3-AMMONIOPROPYL)IMINO}-TRIMETHYLENEDIHALIDES]

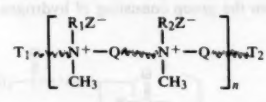
Arthur F. Wagner, Princeton; Nathaniel Grier, Englewood, and Tsung-Ting Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 956,472, Oct. 30, 1978, abandoned, which is a division of Ser. No. 895,908, Apr. 13, 1978, abandoned, which is a division of Ser. No. 783,886, Apr. 1, 1977, Pat. No. 4,098,726, which is a continuation-in-part of Ser. No. 570,910, Apr. 23, 1975, Pat. No. 4,016,209, and a continuation-in-part of Ser. No. 462,263, Apr. 19, 1974, abandoned, and a continuation-in-part of Ser. No. 369,042, Jun. 11, 1973, abandoned. This application Apr. 11, 1979, Ser. No. 28,955

Int. Cl.[2] A61K *31/14, 31/74*

U.S. Cl. 424—78 **2 Claims**

1. A pharmaceutical composition for binding bile acids in the gastroitestinal tract of mammals comprising in unit dosage form from 0.1 to 10 grams of a linear unbranched non-cross-linked polymer of the formula:

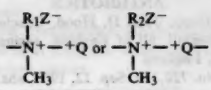


wherein R_1 and R_2 are the same or different and are ammoniumloweralkyl, loweralkylammoniumloweralkyl; diloweralkylammoniumloweralkyl, triloweralkylammoniumloweralkyl, or lower alkyl with the proviso that only one of R_1 and R_2 may be lower alkyl where said ammonio cation is countered with the anion Z; wherein n is an integer such that the number average molecular weight is from 300–50,000;

T_1 and T_2 are end groups;

Z^- is monovalent or polyvalent counter anion;

Q is trimethylene; and the symbol indicates a bond to a plurality of the groups



where R_1, R_2, Q, and Z^- are previously defined.

4,205,065

NON-YELLOWING COMPOSITIONS CONTAINING HEXAMETHYLENETETRAMINE 1,3-DICHLOROPROPENE SALTS

David A. Wilson, Richwood, and Avis L. McCrary, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1979, Ser. No. 4,096

Int. Cl.[2] A61K *31/78;* A01N *9/22;* A61K *31/53;* A01N *9/00*

U.S. Cl. 424—81 **15 Claims**

1. A composition of matter having antimicrobial properties which consists essentially of

(a) cis-1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride; and

as a color-stabilizing additive for the said adamantane in solution, to prevent yellowing of the adamantane solution on aging,

(b) a reducing agent selected from alkali metal sulfites, alkali metal bisulfites, alkaline earth metal sulfites, alkaline earth metal bisulfites, amine sulfites, amine bisulfites, ammonium sulfites, ammonium bisulfites, inorganic hydrides, hydroxylamine, hydroxylamine acid salts and mixtures thereof,

wherein the weight ratio of (a) to (b) is from 1:0.01 to 1:4.

4. A latex formulation of the composition of claim **1**, said latex containing a bactericidal amount, from about 0.01 to about 1.0 weight percent of said adamantane.

5. A latex formulation of the composition of claim **4**, wherein said latex is 75 percent vinyl acetate/-25 percent butyl acrylate.

4,205,066

BAIT COMPOSITIONS FOR ANTHROPOPHILIC FLIES

Claude Hennart, Seraincourt; Bernard Rabussier, Avanton; Jean-Pierre Mandon, Chasseneuil-du-Poitou, and Joel Sapin, Liguge, all of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.

Filed Oct. 10, 1978, Ser. No. 949,600

Claims priority, application Luxembourg, Oct. 10, 1977, 78277

Int. Cl.[2] A01N *7/14*

U.S. Cl. 424—84 **13 Claims**

1. A bait composition for anthropophilic flies, containing a lure and a food, wherein the lure is present in the composition in a proportion of about 0.05 to 2 percent relative to the weight of the composition and is selected from the group consisting of the cis- stereoisomers of straight-chain alkenes having 19 to 23 carbon atoms in which the ethylenic bond is located after a carbon atom in the 9-position and mixtures of these alkenes, and wherein the food is or contains an aminoacid source of the biochemical class of protides.

4,205,067

ANTIBIOTICS

Martin Cole, Dorking; John D. Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, England

Division of Ser. No. 725,383, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,772, Aug. 23, 1976, abandoned, which is a division of Ser. No. 559,803, Mar. 19, 1975, abandoned. This application Dec. 7, 1977, Ser. No. 858,101
Claims priority, application United Kingdom, Mar. 28, 1974, 13856/74
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—114 32 Claims

1. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises a synergistically effective amount of a pharmaceutically acceptable dibasic salt of MM 13902 which is at least 50% pure and an antibacterially effective amount of amoxycillin or the acetoxymethyl, pivaloyloxymethyl or phthalidyl ester thereof, which substance MM 13902 is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_8N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:

(a) in aqueous solution, it has a characteristic ultraviolet spectrum with absorption maxima at about 305 nm and at about 225 nm substantially as shown in FIG. 1;

(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum which has absorption maxima at inter alia about 3450, 2950, 1750, 1620, 1510, 1400 and 1260 cm^{-1};

(c) it has a characteristic N.M.R. spectrum when taken in D_2O which spectrum possesses inter alia (i) a pair of low field doublets centered at approximately 2.85t and 4.00t with coupling constants of approximately 14 Hz; (ii) a doublet centered at approximately 8.55t and (iii) a sharp singlet at approximately 8.00t;

(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhi* and *Pseudomonas aeruginosa;* and

(e) when mixed with ampicillin it synergizes its activity against organisms including strains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morganii* and *Staphylococcus aureus Russell,*

in combination with a pharmaceutically acceptable carrier; said pharmaceutically acceptable di-basic salt of MM 13902 and said amoxycillin or ester being present in a ratio of 10:1 to 1:10.

4,205,068

β-LACTAMASE INHIBITOR EM4615

Richard B. Sykes, Rocky Hill; J. Scott Wells, Ringoes; Pacifico A. Principe, South River, and Wen C. Liu, Princeton Junction, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 18, 1978, Ser. No. 906,906
Int. Cl.[2] A61K *37/64*
U.S. Cl. 424—117 10 Claims

10. β-lactamase inhibitor EM4615, and salts thereof, said EM4615 having an infrared spectrum, as the sodium salt, as in FIG. 1; having the following approximate elemental analysis as the sodium salt: C,49.99%; H,7,71%; O,23.69%; S,10.51%; Na,8.10%; the barium salt thereof melts in the range of about 144°–146° C., the sodium salt thereof is soluble in water and methanol and insoluble in acetone and chloroform; the barium salt thereof is soluble in dimethylsulfoxide and dimethylformamide and insoluble in water, methanol, acetone and chloroform.

4,205,069

DIPEPTIDE NARCOTIC ANTAGONISTS

James D. Belluzzi, King of Prussia; William H. McGregor, Malvern, and Larry Stein, Haverford, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 29, 1978, Ser. No. 947,276
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 5 Claims

1. A process for antagonizing the effect of a narcotic analgesic agent in warm-blooded animals which comprises administering to a warm-blooded animal in need thereof a sufficient amount of a compound of the formula:

A—X—Y—B

wherein X is D-Tyr or L-Tyr; Y is D-Ala; A is hydrogen, allyl, or lower alkyl of 1 to 3 carbon atoms; B is $—NH_2$, —OMe, or $—NHNH_2$; and the pharmacologically acceptable salts thereof.

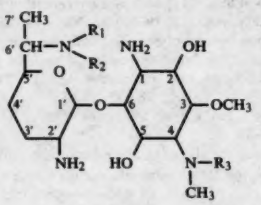
4,205,070

6'N-ALKYL- AND 6',6'-DI-N-ALKYL DERIVATIVES OF FORTIMICINS A AND B

John S. Tadanier, Waukegan; Daniel A. Dunnigan, Winthrop Harbor; Leslie A. Freiberg, and Jerry R. Martin, both of Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 21, 1977, Ser. No. 863,018
Int. Cl.[2] A61K *31/71;* C07H *15/22*
U.S. Cl. 424—180 29 Claims

1. A compound of the formula



wherein R_1 is loweralkyl, R_2 is hydrogen or loweralkyl and R_3 is selected from the group consisting of hydrogen acyl of the formula

wherein R is loweralkyl, hydroxyacyl, aminoacyl, N-monoloweralkyl-aminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, aminoacyl, an aminoacid residue, loweralkyl, hydroxyloweralkyl, aminoloweralkyl, N-monoloweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, or hydroxy-substituted aminoloweralkyl, and the pharmaceutically acceptable salts thereof.

29. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,205,071
PHARMACEUTICAL COMPOSITIONS HAVING IMMUNOSUPPRESSANT ACTIVITY AND METHODS THEREFOR

Graham J. Durant; Charon R. Ganellin, and Margaret R. Vickers, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

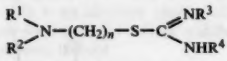
Continuation-in-part of Ser. No. 795,983, May 11, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,773

Claims priority, application United Kingdom, May 14, 1976, 19994/76

Int. Cl.[2] A61K *31/33, 31/415, 31/505;* **C07D** *233/42*

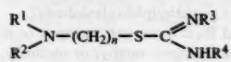
U.S. Cl. 424—244 **9 Claims**

1. An isothiourea derivative of the Formula:



wherein n is 2, 3 or 4; R^1 and R^2, which may be the same or different, are lower alkyl; and R^3 and R^4, which may be the same or different, together form a $-(CH_2)_x-$ group wherein x is 2, 3 or 4; provided that when n is 2, R^3 and R^4 must be such that together they form a $(CH_2)_4$ group; and the pharmaceutically acceptable acid addition salts thereof.

5. A method of producing immunosuppressant activity by administering to an animal in need thereof an effective amount of an isothiourea of the formula:



wherein

n is 2, 3 or 4;

R^1 and R^2, which may be the same or different, are lower alkyl; and

R^3 and R^4, which may be the same or different, together form a $-(CH_2)_x-$ group where x is 2, 3 or 4, or a pharmaceutically acceptable acid addition salt thereof.

4,205,072
3-CARBAMOYLOXYMETHYL-7-(AMINO-4-THIAZOLYL-ACETAMIDO)-CEPHALOSPORANIC ACID DERIVATIVES

Michel Vignau, Neuilly-sur-Seine, and Andre Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

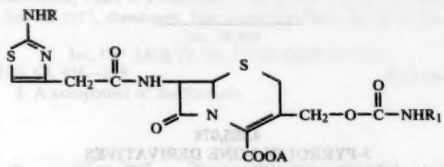
Filed Feb. 4, 1977, Ser. No. 765,439

Claims priority, application France, Feb. 5, 1976, 76 03210

Int. Cl.[2] C07D *501/20*

U.S. Cl. 424—246 **13 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of hydrogen and a group easily removable by acid hydrolysis or hydrogenolysis selected from the group consisting of tert.-butoxycarbonyl, trityl, benzyl, dibenzyl, trichloroethyl, carbobenzyloxy, formyl, trichloroethoxycarbonyl and 2-tetrahydropyranyl, R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and A is selected from the group consisting of hydrogen, alkali metal, an equivalent of alkaline earth metal and magnesium and a non-toxic, pharmaceutically acceptable organic amine base.

7. An antibiotic composition comprising an antibiotically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,205,073
ANTI-DIARRHEAL ANILINO NICOTINIC ACIDS AND METHOD OF USING SAME

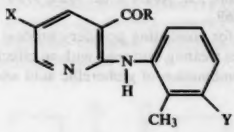
Margaret H. Sherlock, Bloomfield, and James F. Long, Whippany, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Apr. 30, 1975, Ser. No. 572,982

Int. Cl.[2] A61K *31/455;* **A61J** *3/06, 3/10*

U.S. Cl. 424—266 **11 Claims**

1. The method for the treatment and control of diarrhea which comprises administering to a mammal suffering from diarrhea a therapeutically effective quantity of an anilino nicotinic acid of the formula:



and the pharmaceutically acceptable salts thereof, wherein Y represents trifluoromethyl, difluoromethyl, or nitro, X represents hydrogen, halogeno, or hydroxy, and R represents OH, —O-lower alkyl, $O-CH_2CHOHCH_2OH$, O-alkyl-NR_1R_2, NHOH or NR_1NR_2, wherein R_1 and R_2 are each hydrogen or lower alkyl.

4,205,074
ANTI-SPASMODIC SUBSTITUTED QUINOLIZIDINE AND INDOLIZIDINE COMPOUNDS

Hideo Kato, and Eiichi Koshinaka, both of Katsuyamashi, Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Japan

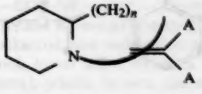
Continuation-in-part of Ser. No. 904,498, May 10, 1978, abandoned, and a continuation-in-part of Ser. No. 904,530, May 10, 1978, abandoned, and a continuation-in-part of Ser. No. 904,533, May 10, 1978, abandoned, and a continuation-in-part of Ser. No. 904,534, May 10, 1978, abandoned, and a continuation-in-part of Ser. No. 904,535, May 10, 1978, abandoned, and a continuation-in-part of Ser. No. 969,400, Dec. 14, 1978, abandoned, and a continuation-in-part of Ser. No. 969,401, Dec. 14, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,515

Claims priority, application Japan, May 16, 1977, 52/55266; Aug. 9, 1977, 52/107270; Nov. 9, 1977, 52/133526; Dec. 8, 1977, 52/146613; Dec. 21, 1977, 52/152841; Feb. 28, 1978, 53/21534; Mar. 22, 1978, 53/31652; Mar. 22, 1978, 53/31653; May 23, 1978, 53/60654; May 23, 1978, 53/60656

Int. Cl.[2] A61K *31/445;* **C07D** *455/02, 471/04*

U.S. Cl. 424—267 **32 Claims**

1. A compound selected from quinolizidine- and indolizidine compounds of the formula:



wherein A represents a phenyl group or a 2-thienyl group, n is an integer of 3 or 4, and a pharmaceutically acceptable acid addition salt thereof, and quaternary ammonium salt thereof.

2. A compound as claimed in claim 1 wherein n represents 4.

4. Method of treating spasm or spasm-associated ulcer in a

patient afflicted therewith, which comprises the step of administering to said patient an effective antispasmodic amount of a compound of claim 2.

4,205,075

PROCESSES AND COMPOSITION FOR COMBATING FUNGI

Brian C. Baldwin, Wargrave; Margaret C. Shephard, Maidenhead, and Anthony M. Skidmore, Wokingham, all of England, assignors to Imperial Chemical Industries Limited, London, England

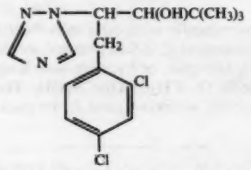
Filed Jul. 29, 1977, Ser. No. 820,630

Claims priority, application United Kingdom, Jul. 29, 1976, 31649/76

Int. Cl.[2] A01N *9/02, 9/22, 9/28*

U.S. Cl. 424—269 2 Claims

1. A process for combating powdery mildew in cereal seed which comprises treating said seed with an effective amount of a synergistic combination of gibberellic acid and a compound of the formula:



, the ratio of said compound of gibberellic acid being 50:1 to 5:1.

4,205,076

LIPOGENESIS INHIBITION BY CERTAIN ESTERS OF SUBSTITUTED BENZODIOXINCARBOXYLIC ACIDS

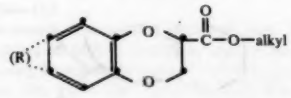
Harry G. Durham, Modesto, Calif., and John B. Carr, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 951,535, Oct. 16, 1978, abandoned. This application Apr. 26, 1979, Ser. No. 33,635

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 1 Claim

1. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally a lipogenesis inhibiting amount of a compound of the formula



wherein "alkyl" is alkyl of from one to four carbon atoms, and R is a moiety which is one of: formyl, acetyl, benzoyl, acetamido, (hydroxyimino)methyl, 1-(hydroxyimino)ethyl, (methoxyimino)methyl, 1-(methoxyimino)ethyl, amino, benzamido, methylsulfonylamino, and 2-methyl-4-thiazolyl.

4,205,077

BENZIMIDAZOLE SULPHIDES AS ANTHELMINTIC AGENTS

Ernst Aufderhaar, Kaiseraugst; Jean J. Gallay, Magden; Manfred Kühne, Pfeffingen; Alfred Meyer, Basel; Oswald Rechsteiner, Binningen; Max Schellenbaum, Muttenz, and Jean-Paul Fumeaux, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

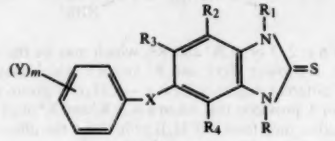
Filed Apr. 10, 1978, Ser. No. 894,974

Claims priority, application Luxembourg, Apr. 12, 1977, 77121; Apr. 12, 1977, 77122; Mar. 14, 1978, 79227

Int. Cl.[2] A61K *31/415;* C07D *235/20, 235/28*

U.S. Cl. 424—273 B 8 Claims

1. A method for combating parasitic helminths in animals which comprises administering to an animal infested with said helminths an anthelmintically effective amount of a compound of the formula



in which

each of R and R_1 is hydogen, alkanoyl of from 1 to 4 carbon atoms, alkoxycarbonyl or from 1 to 4 carbon atoms, alkylsulphonyl of from 1 to 4 carbon atoms, benzoyl, phenylsulphonyl or p-methylphenylsulphonyl,

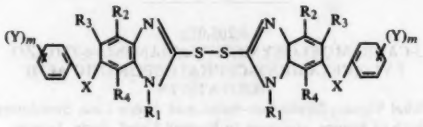
each of R_2 and R_4 is hydrogen, halogen or methyl,

R_3 is hydrogen, halogen, methyl or methoxy,

X is oxygen or sulphur,

Y is halogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, methylthio, methylsulphinyl, methylsulphonyl, trifluoromethyl, nitro, hydroxyl, cyano or acetyl, and

m is 0, 1, 2 or 3, including the possible tautomers of said compound and the disulphide of the formula



obtainable by oxidation of said compound in which R is hydrogen.

4,205,078

3-PYRROLIN-2-ONE DERIVATIVES

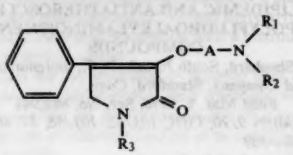
Gerhard Satzinger, Denzlingen; Manfred F. Herrmann, St. Peter, and Gustav Hechtfischer, Freiburg, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 821,259, Aug. 3, 1977, abandoned. This application Jul. 5, 1978, Ser. No. 922,018

Int. Cl.[2] C07D *207/38;* A61K *31/40*

U.S. Cl. 424—274 12 Claims

1. A compound of the formula:



wherein R_1 and R_2, which can be the same or different, are straight-chain or branched alkyl radicals containing up to 3 carbon atoms, A is a straight-chain or branched hydrocarbon chain containing 2 to 4 carbon atoms and R_3 is a saturated or unsaturated, straight-chain or branched aliphatic hydrocarbon radical containing up to 6 carbon atoms or is the radical —Alk—Ar, wherein Alk is an alkylene chain containing up to 3 carbon atoms and Ar is a phenyl radical; and the pharmacologically compatible salts thereof.

12. A pharmaceutical composition comprising an anti-hypertensive effective amount of at least one compound according to claim 1, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,205,079

BENZODIOXINCARBOXAMIDES

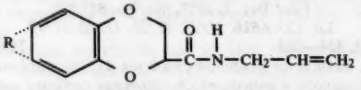
Harry G. Durham, Modesto, Calif., and John B. Carr, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 951,536, Oct. 16, 1978, abandoned. This application Apr. 26, 1979, Ser. No. 33,633

Int. Cl.[2] A61K *31/38, 31/335;* C07D *319/08*

U.S. Cl. 424—275 **2 Claims**

1. A compound of the formula



wherein R is a moiety which is one of (hydroxyimino)methyl, 1-(hydroxyimino)ethyl, (methoxyimino)methyl, 1-(methoxyimino)ethyl, acetamido, benzamido, and 2-methyl-4-thiazolyl.

2. A method of inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally a lipogenesis inhibiting amount of a compound of claim 1.

4,205,080

2,3-DIHYDRO BENZOFURAN CARBOXAMIDES

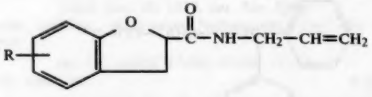
John B. Carr, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 938,610, Aug. 31, 1978, abandoned, which is a continuation-in-part of Ser. No. 817,898, Jul. 31, 1977, abandoned. This application May 16, 1979, Ser. No. 39,624

Int. Cl.[2] A61K *31/38, 31/34;* C07D *307/85*

U.S. Cl. 424—275 **2 Claims**

1. A compound of the formula:



wherein

(a) R is bonded to the carbon atom at the 5-position in the molecule, and is cycloalkyl of from three to six carbon atoms; alkyl of from four to eight carbon atoms; thienyl; or phenyl, phenoxy, benzyl or benzoyl or any of these substituted by one of alkyl or alkoxy of from one to six carbon atoms, acetamido, 1-hydroxyethyl, and nitro;

(b) R is bonded to the carbon atom at the 4-position in the molecule, and is phenoxy or substituted phenoxy as indicated above.

2. A method of inhibiting lipogenesis in a mammal, which comprises administering orally or parenterally an effective amount of a compound of claim 1.

4,205,081

COMPOSITION AND METHOD FOR PREVENTING OR TREATING SWINE DYSENTERY

Koji Sakamoto; Takeshi Asano, both of Takasaki; Kazuo Mizuochi, Tokyo, and Kanemichi Sasaki, Koshigaya, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha and Chugai Seiyaku Kabushiki Kaisha, both of Tokyo, Japan

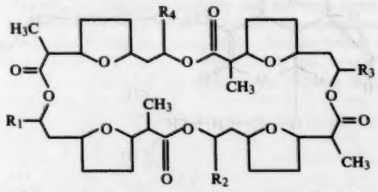
Filed Jan. 30, 1979, Ser. No. 7,794

Claims priority, application Japan, Jan. 31, 1978, 53-8827

Int. Cl.[2] A61K *31/335*

U.S. Cl. 424—279 **7 Claims**

1. A method for treating swine dysentery characterized by administering, to swine, an effective quantity of one or more kinds of macrotetrolide antibiotic substances represented by the following general formula:



wherein R_1, R_2, R_3 and R_4 are lower alkyl groups.

4,205,082

SUBSTITUTED COUMARIN COMPOUNDS

Pier G. Ferrini, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

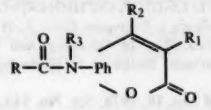
Filed Aug. 19, 1977, Ser. No. 826,224

Claims priority, application Luxembourg, Aug. 31, 1976, 75688

Int. Cl.[2] C07D *311/16;* A61K *31/37;* C07D *405/04*

U.S. Cl. 424—281 **9 Claims**

1. A benzopyrane compound of the formula:



wherein R is carboxyl, carboxyl esterified by a lower alkanol which is unsubstituted or substituted by substituted or unsubstituted phenyl or carboxyl esterified by a substituted or unsubstituted phenol, Ph denotes a 1,2-phenylene radical which contains the group R—CO—NR_3— and is otherwise unsubstituted or is substituted, R_1 and R_2 independently of one another are hydrogen, lower alkanoyl, free carboxyl or carboxyl esterified by a lower alkanol, lower alkyl which is unsubstituted or substituted by phenyl, which, in turn, can be substituted, or substituted or unsubstituted phenyl or pyridyl, or conjointly are tri-, tetra- or penta-methylene, and R_2 can also be free hydroxyl or hydroxyl etherified by a lower alkanol or esterified by a lower alkanecarboxylic acid, and R_3 is hydrogen or lower alkyl, substituents of substituted phenyl, phenol, 1,2-phenylene Ph and pyridyl radicals are lower alkyl, lower alkoxy,

halogen, hydroxyl and trifluoromethyl, or a pharmaceutically acceptable salt thereof.

9. A pharmaceutical composition comprising an anti-allergically effective amount of a compound as claimed in claim 1 together with a conventional pharmaceutical carrier.

4,205,083

CYCLOPENTAPYRANS

Peter W. Thies, Hanover, Fed. Rep. of Germany, assignor to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

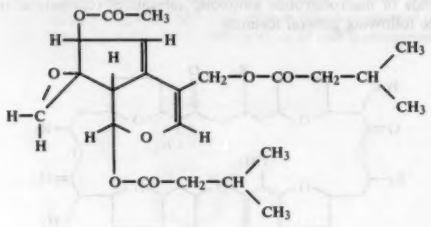
Continuation-in-part of Ser. No. 519,986, Jan. 11, 1966, abandoned, and a continuation of Ser. No. 601,548, Apr. 8, 1975, abandoned, which is a continuation of Ser. No. 401,904, Sep. 28, 1973, abandoned, and Ser. No. 764,199, Oct. 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 519,986,. This application Jan. 13, 1978, Ser. No. 869,385

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1968, 1768092

Int. Cl.[2] A61K *31/33;* **C07D** *407/02*

U.S. Cl. 424—283 **7 Claims**

1. A cyclopentapyran ester $C_{22}H_{30}O_8$ of the formula



said ester, in the substantially pure state, having a refraction index $n_D^{20}=1.4923$ and an optical rotation of $[\alpha]_D^{21}=+151°$ (in methanol), said ester, on degradation by heating to 100° C. and chromatographical separation, yielding 4-isovaleroxy methyl-7-formyl cyclopenta(c)pyran as thermal degradation product.

7. In a method of treating humans or animals affected by bacterial infections and especially by infections caused by bacteria of the Mycobacterium group, the step which comprises administering to such humans or animals an effective amount of the compound of claim 1.

4,205,084

CONTROL OF INSECTS WITH 2-ETHYL-1,6-DIOXASPIRO[4.4]NONANE

Jean P. Vite, Freiburg i. Breisgau; Ernst J. W. Francke, Reinbek, both of Fed. Rep. of Germany, and Günther Ohloff, Bernex, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

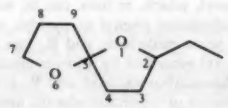
Filed Sep. 18, 1978, Ser. No. 943,488

Claims priority, application United Kingdom, Sep. 23, 1977, 39828/77

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—285 **3 Claims**

1. A method of attracting insects of the order *Pityogenes chalcographus,* which comprises permeating the atmosphere in an area infested with said insects with an effective attractant amount of a compound of formula



(I)

4,205,085

HYPOLIPIDEMIC AND ANTIATHEROSCLEROTIC 4-(POLYFLUOROALKYLAMINO)PHENYL COMPOUNDS

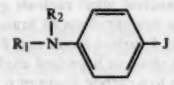
Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1978, Ser. No. 884,941

Int. Cl.[2] A01N *9/20;* **C07C** *103/22, 101/58, 87/48, 143/58*

U.S. Cl. 424—309 **10 Claims**

1. A compound of the formula



wherein R_1 is a saturated or unsaturated hydrocarbon radical of 7–19 carbon atoms which may be branched or unbranched and which may contain a saturated or unsaturated cycloalkyl group, said radical containing one or more perfluorinated (—CF_2— or —CF_3) carbon atoms excluding the carbon adjacent to the nitrogen atom; R_2 is selected from the group consisting of hydrogen, methyl, carboxymethyl, acetyl, succinyl, 1-(sodiumsulfo)loweralkyl, 1-(sodiumsulfo)polyhydroxyalkyl, and 3-aryl-1,3-bis(sodiumsulfo)alkyl; and J is carboxyloweralkyl, carboxyloweralkenyl, carboxyloweralkynyl, carboalkoxyloweralkyl, carboalkoxyloweralkenyl, carboalkoxyloweralkynyl; and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof.

4,205,086

METHOD FOR THE TREATMENT OF GALLSTONES

Vigen K. Babayan, Indianapolis, Ind., assignor to Stokeley-Van Camp, Inc., Indianapolis, Ind.

Filed Dec. 2, 1977, Ser. No. 857,001

Int. Cl.[2] A61K *31/23, 31/20, 31/22, 31/19*

U.S. Cl. 424—312 **21 Claims**

1. A method for gradually dissolving a cholesterol-containing gallstone in a patient which comprises perfusing adjacent the gallstone an effective amount of a liquid form of a physiologically-compatible compound selected from the group consisting of fatty acids, alcohol esters of fatty acids and mixtures of fatty acids and alcohol esters of fatty acids, said perfusion being performed to solubilize at least a portion of the gallstone.

4,205,087

ACETIC ACID DERIVATIVES

Wilson S. Waring, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

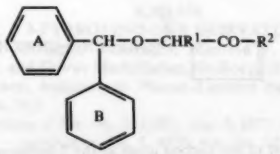
Filed Apr. 26, 1977, Ser. No. 790,873

Claims priority, application United Kingdom, May 21, 1976, 21064/76

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 424—317 **4 Claims**

1. A sterile pharmaceutical composition in a form suitable for administration in the treatment of arthritic joint diseases and which comprises an effective amount of an acetic acid derivative of the formula

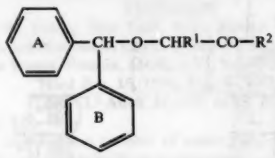


I

wherein R^1 is hydrogen, R^2 is a hydroxy or a C_{1-6}-alkoxy radical; and ring A and ring B, which may be the same or

different, are monohalogenophenyl radicals; or a pharmaceutically acceptable base-addition salt of said derivatives wherein R^2 is a hydroxy radical in association with a pharmaceutically acceptable diluent or carrier.

4. A method for the treatment of arthritic joint diseases in warm-blooded animals requiring such treatment which comprises administering an effective amount of a composition which comprises an effective amount of an acetic acid derivative of the formula



I

wherein R^1 is hydrogen, R^2 is a hydroxy or a C_{1-6}-alkoxy radical; and ring A and ring B, which may be the same or different, are monohalogenophenyl radicals; or a pharmaceutically acceptable base-addition salt of said derivatives wherein R^2 is a hydroxy radical in association with a pharmaceutically acceptable diluent or carrier.

4,205,088

COMPOSITIONS OF AND NEW USES FOR N-ACYLANILINOBUTYRIC ACIDS

Wolfgang Schoetensack, Hegne, and Richard Riedel, Constance, both of Fed. Rep. of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Fed. Rep. of Germany

Division of Ser. No. 571,501, Apr. 25, 1975, Pat. No. 4,034,111. This application Apr. 8, 1977, Ser. No. 785,959

Claims priority, application Luxembourg, Apr. 30, 1974, 69970; Fed. Rep. of Germany, Oct. 25, 1974, 2450680

Int. Cl.² A61K *31/195*

U.S. Cl. 424—319 **19 Claims**

1. A process which comprises administering to a warm-blooded animal having a pancreas insufficiency an amount of medicament composition sufficient to alleviate such insufficiency, the medicament composition having a plurality of ingredients and comprising from one to 95 percent by weight of at least one physiologically-active and pharmacologically-acceptable N-acylanilinobutyric acid or a substantially non-toxic salt thereof.

4,205,089

SOLVENT VEHICLE FOR THE PARENTERAL ADMINISTRATION OF THERAPEUTICS

Cornelis A. Ladage, De Meern; Douwe J. van Linge, Eemnes, and Huibert A. van Riessen, Lunteren, all of Netherlands, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Filed Jan. 16, 1979, Ser. No. 3,968

Claims priority, application Netherlands, Jan. 20, 1978, 7800762

Int. Cl.² A61K *47/00, 45/00, 31/055*

U.S. Cl. 424—365 **4 Claims**

1. A solvent vehicle for the parenteral administration of therapeutics, said vehicle comprising DMSO and a symmetric or unsymmetric ester of adipic acid wherein both alkyl groups together contain six to twelve carbon atoms and wherein the smaller alkyl group present if said ester is unsymmetric contains at least two carbon atoms.

4,205,090

PREPARATION OF CHEESE USING ULTRAFILTRATION

Jean-Louis J. Maubois, Rennes; Germain P. C. B. Mocquot, Versailles, and Louis J. Vassal, Jouy En Josas, all of France, assignors to Etablissement Public: Institut National de la Recherche Agronomique, Paris, France

Continuation of Ser. No. 299,837, Oct. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 53,002, Jul. 7, 1970, abandoned. This application Dec. 5, 1975, Ser. No. 637,981

Claims priority, application France, Jul. 18, 1969, 69.24555; Oct. 22, 1971, 71.38091

Int. Cl.² A23C *19/02*

U.S. Cl. 426—40 **16 Claims**

1. A process for making a fat containing rennet coagulated cheese from milk, the cheese containing substantially all the casein and soluble proteins of the milk, which comprises

separating the milk by ultrafiltration into a filtrate and a liquid retentate, by flowing the milk over semi-permeable membranes by introducing said milk into a series of modules, each consisting of porous plates, each of said porous plates serving as a frame for one of said semipermeable membranes and said plates being separated by a specific interval to form an interspace, whereby said milk is separated into a filtrate, which is collected in spaces separating pairs of consecutive modules, and into retentate which circulates through said modules and becomes more concentrated in proteins as it circulates, the semipermeable membranes having an average pore diameter falling in the range which will permit water, lactose and soluble mineral salts contained in the milk to pass through the membrane as a filtrate up to 30 mμ, the flow of the liquid within the interspaces being sufficient to hinder film formation on the surface of said membranes which would prevent the flow of said water, lactose and soluble mineral salts passing through said membranes, said separation occurring at a pressure of 1 to 50 kg/cm², and such that substantially all the casein and soluble proteins of said milk are retained in the liquid retentate;

continuing said separation until a free flowing liquid retentate, collected separately from said filtrate, is obtained which has substantially the same total protein concentration and non-protein soluble constituents concentration as is known to exist in the milk derived components of a desired natural cheese at the end of the whey draining process, and thereafter adding sufficient rennet to said retentate to cause coagulation and cheese formation.

4,205,091

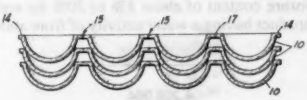
EDIBLE SERVER

William J. Van Horne, P.O. Box 39113 Bolton Station, Atlanta, Ga. 30318

Filed Nov. 3, 1975, Ser. No. 627,943

Int. Cl.² A21D *13/00*

U.S. Cl. 426—138 **2 Claims**



1. A set of edible servers each comprising an elongated wafer formed with a series of cup-shaped receptacles sized for individual disposition within a human mouth and with bridges joining adjacent receptacles together with each bridge having a score line extending between and segmenting adjacent cup-shaped receptacles and wherein said cup-shaped receptacles have substantially flat, mutually coplanar flanges extending from their lips and merging with said bridges whereby the cup-shaped receptacles may be filled with fluid foodstuff, serially inserted into a human mouth, and individually broken

off from the remainder of the wafer along the score lines and eaten, and wherein said edible servers are stacked one upon the other with at least a portion of the cup-shaped receptacles of one server nestled within the cup-shaped receptacles of another server.

4,205,092

ACID REDUCTION IN WINE BY ION EXCHANGE

Leonard R. Mattick, Geneva, N.Y., and Edward V. Gogel, Downers Grove, Ill., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Aug. 4, 1978, Ser. No. 931,223
Int. Cl.[2] C12H *1/04*
U.S. Cl. 426—271 **4 Claims**

1. A method of treating wines having an undesirably high total acidity contributed by a high malic acid concentration, without significantly affecting pH, which comprises:

(a) passing the wine through a cation exchange resin in the H^+ form;

(b) subsequently passing said wine through a weakly basic, nonporous, amine type anion exchange resin in the free base form, thereby lowering the malic acid content of said wine, while maintaining the ratio of malic acid to tartaric acid constant;

(c) blending a volume of the ion exchanged wine with a volume of untreated wine in a manner such that the volume of ion exchanged wine is less than or equal to the volume of untreated wine.

4,205,093

FOOD PRODUCT CONTAINING ORANGE CITRUS JUICE VESSICLE SOLIDS

Jon R. Blake, Brooklyn Center, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 7, 1978, Ser. No. 967,443
Int. Cl.[2] A23B *7/10*; A23L *1/212*
U.S. Cl. 426—333 **11 Claims**

1. A shelf-stable, elastic, solid form food product exhibiting prolonged moisture retention, comprising:

A. from about 12% to 40% by weight of a nutritive carbohydrate sweetening agent;

B. from about 20% to 90% by weight orange citrus juice vessicle solids wherein the orange citrus juice vessicle solids comprise a mixture of:

(1) pasteurized raw orange citrus juice vessicles having a moisture content of about 95% to about 98% by weight of said raw juice vessicles, and

(2) highly processed orange citrus juice vessicles having a moisture content of about 3% to about 12% by weight of said highly processed juice vessicle solids,

wherein the weight ratio of solids provided by the raw juice vessicles to the solids provided by the highly processed juice vessicle solids ranges from about 10:1 to about 20:1;

C. sufficient amounts of edible organic acid to provide a pH of from about 2.5 to 4.5; and

D. a moisture content of about 8% to 30% by weight; said food product having a water activity of from about 0.30 to 0.85.

4,205,094

TEXTURIZING AND STEAM DEFLAVORING SOY PROTEIN WITH HIGH-SPEED TURBINE MIXING

James C. Baird, Cincinnati, and Glenn R. Warfield, Hamilton, both of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed May 3, 1978, Ser. No. 902,512
Int. Cl.[2] A23J *1/14*
U.S. Cl. 426—459 **19 Claims**

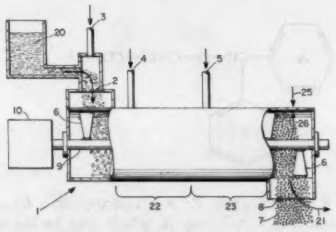
1. A process for texturizing and deflavoring defatted particulate oil seed protein material comprising the steps of:

1. uniformly wetting said material until its moisture content is raised to a value of from about 25% to about 65%, said material being maintained in a particulate form;

2. steam cooking the moistened material with from about 0.1 to about 2 parts of direct steam per part of material on a dry weight basis;

3. subjecting said material to high-speed centrifugal mixing while performing said steam cooking step;

said high-speed centrifugal mixing being provided by a turbine mixer having a cylindrical chamber and a number of rotating



paddle-blades which sweep said particulate material along the inner surface of said cylindrical chamber and wherein said high-speed mixing paddle-blades rotate at an angular velocity greater than a velocity sufficient to balance gravity force on said particulate material with centrifugal force, said blades sweeping said particulate material against said inner surface to provide sufficient high shear turbulence for fast and efficient deflavoring and texturization to produce a wet, texturized, deflavored particulate oil seed material.

4,205,095

GLYCERIDES

Marshall Pike, Stanhope Rd., Camberley, Surrey; Iain G. Barr, 35, Regent Rd., Liverpool L5 9TB, both of England, and Florent Tirtiaux, 601, Chaussee de Charleroi, B6220 Fleurus, Belgium

Continuation of Ser. No. 847,557, Nov. 1, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,686
Claims priority, application United Kingdom, Nov. 4, 1976, 45986/76
Int. Cl.[2] A23D *5/00, 5/02*
U.S. Cl. 426—607 **13 Claims**

1. A method for producing a cocoa butter substitute or extender comprising the steps of:

1. maintaining a phospholipid-free neutralized pre-bleached palm oil having an IV of 50–55 at a temperature of 42°–52° C. for a period of at least 6 hours to initiate crystal formation.

2. increasing the temperature of the palm oil to 70°–75° C. over a period not exceeding 2 hours to melt all the solids except seed crystals and then immediately subjecting to cooling the palm oil to a temperature of 28°–33° C. over a period of not less than 5 hours to produce a first liquid fraction of IV 55–60 and a first solid fraction of IV 38-44 and melting point 50°–55° C.

3. separating the first liquid fraction from the first solid fraction within 5 hours of completion of formation of the first solid fraction.

4. maintaining the first liquid fraction at a temperature of at least 65° C. for a period of time sufficient to form a fluid homogeneous crystal free oil and then subjecting the first liquid fraction to a temperature of 38°–48° C. for a period of at least 4 hours to initiate crystal formation.

5. increasing the temperature of the first liquid fraction to 60°–65° C. over a period of 1.5–2 hours to melt all the solids except seed crystals and then immediately subjecting to cooling the first liquid fraction to a temperature of 14°–17° C. over a period of not less than 10 hours to form a second liquid fraction of IV 59-64 and a cloud point of

3°–7° C. and a palm oil mid-fraction of IV 48-53 and a slip melting point of 32°–36° C.

6. separating the second liquid fraction from the mid-fraction at a temperature of 14°–17° C. within 3 hours of completion of formation of the mid-fraction, to give a separated mid-fraction for use as said cocoa butter substitute or extender.

4,205,096

CASE III (C) ADHERENT CONTROLLED RELEASE PESTICIDE

Robert W. Young, New York, N.Y.; Samuel Prussin, Carmel, Calif., and Norman G. Gaylord, New Providence, N.J., assignors to Young, Prussin, MGK, J.V., New York, N.Y.

Filed Jun. 15, 1976, Ser. No. 696,269

Int. Cl.[2] A61K *31/695;* **A01N** *17/08*

U.S. Cl. 427—4 **19 Claims**

1. A composition capable of undergoing hydrolysis under ambient conditions to form a polymeric network capable of controlling the release of an insecticide consisting essentially of (a) a hydrolyzable silane selected from the group consisting of (1) a hydrocarbon substituted hydrolyzable silane, and (2) an organopolysiloxane containing hydrolyzable silane groups, or a partial hydrolyzate thereof, and (b) an insecticide.

4,205,097

PROCESS FOR THE THERMAL POLYMERIZATION, POLYCONDENSATION OR CONDENSATION OF MONOMERIC SYNTHETIC-RESIN MATERIALS IN POROUS WORKPIECES

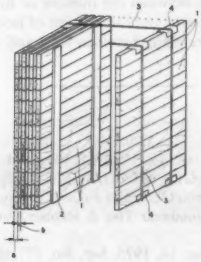
Hanns F. Arledter, Andritzer Reichsstrasse 122, Graz, Austria (A-8010), and Werner Mehl, Badgasse 4, Mödling, Austria (A-2340)

Filed Mar. 14, 1978, Ser. No. 886,612

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711478

Int. Cl.[2] B05D *3/06, 3/02*

U.S. Cl. 427—44 **22 Claims**



1. A process for producing an impregnated article, comprising the steps of:

impregnating a porous workpiece consisting predominantly of wood with a thermally activatable substantially hot-water-insoluble polymerizable solution capable of gelling and hardening within the pores of the workpiece; and

thermally polymerizing said solution within the pores of said workpiece by immersing said workpiece after impregnation directly in a liquid heat carrier consisting predominantly of water and having a viscosity of at most 3 cps so that the heat carrier contacts surfaces of the workpiece impregnated with said solution and penetrates limitedly into said pores without significant removal of said solution from said pores, said heat carrier being at a temperature sufficient to effect chemical reaction of the solution within the pores of the workpiece.

4,205,098

SELENIUM PELLETS FOR USE IN VACUUM-DEPOSITION AND METHOD OF PRODUCING SUCH PELLETS

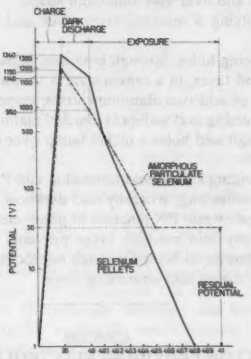
Shuji Kobayashi, Inagi; Mitsuo Aoyagi, Hadano; Tominori Kanno, Hadano; Kazuei Ueno, Hadano, and Shin-ichi Nomura, Hadano, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1978, Ser. No. 952,217

Claims priority, application Japan, Oct. 18, 1977, 52-124020

Int. Cl.[2] C23C *13/00;* **G03G** *5/082*

U.S. Cl. 427—76 **6 Claims**



1. A method for vacuum-depositing a material selected from a group consisting of selenium alone and selenium containing at least one additive by depositing said material through evaporation thereof in vacuum onto a substrate to produce a deposited selenium film thereon, the improvement wherein a powdery material selected from a group consisting of powdery metallic selenium alone and a mixture of powdery metallic selenium and at least one additive is compacted under pressure to produce tablets, and the tablets are degased by heating the tablets at an elevated temperature below the melting point of metallic selenium, and thereafter the tablets are used as a source material for the vacuum deposition.

4,205,099

METHOD FOR MAKING TERMINAL BUMPS ON SEMICONDUCTOR WAFERS

Leith Jones, Wakefield, Mass., and N. Christian McGrath, Strafford, N.H., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 14, 1978, Ser. No. 896,256

Int. Cl.[2] C23C *3/00;* **C25D** *5/02*

U.S. Cl. 427—90 **20 Claims**

1. A method for making solderable bump terminals on each

of a plurality of semiconductor devices, a group of said plurality of devices being formed in each of a plurality of wafers, each of said semiconductor devices having at least one PN junction formed at a front surface of one of said wafers, comprising

(a) forming a first insulative layer over said front surface of each of said wafers;

(b) forming over said first layer two spaced aluminum film strips that contact the P-type and the N-type regions, respectively, of said PN junction through vias provided in said first insulative layer;

(c) forming a second insulative layer over said first insulative layer and over said aluminum strips;

(d) applying a masking layer over said second insulative layer;

(e) opening holes, through both said masking layer and said second layer, in a region over a terminal pad portion of each of said two aluminum strips, respectively;

(f) immersing said wafers in a nickel plating solution to form through said holes a nickel bump over each of said pads; and

(g) providing a dark environment at said PN junction during said immersing; whereby said darkness prevents the generation by said PN junction of photo electric currents and whereby said masking layer prevents the formation of spurious metal bumps through microcracks in said second layer during said immersing steps.

4,205,100

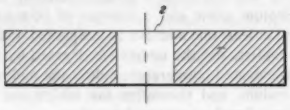
SYSTEM FOR PROVIDING ELECTROLESSLY NICKEL COATED POLISHED HIGH SPEED MULTI-FACETED POLYGONAL SCANNERS

Tibor Fisli, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 19, 1976, Ser. No. 687,961

Int. Cl.[2] G02B *1/10, 5/08*

U.S. Cl. 427—162 **5 Claims**



1. A process for providing high speed multi-faceted polygonal scanners comprising providing a precisely machined aluminum polygon having a multiplicity of smoothly machined facet faces, electrolessly plating said aluminum polygon with nickel and polishing the nickel coated faces to a mirrorlike finish.

4,205,101

PRETREATMENT PROCESS

Norman M. Ness, Taplow, England, assignor to Imperial Chemical Industries Limited, London, England

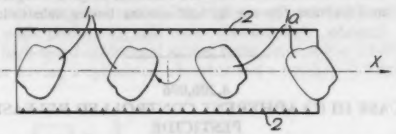
Continuation-in-part of Ser. No. 605,174, Aug. 15, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,785

Claims priority, application United Kingdom, Aug. 19, 1974, 36359/74

Int. Cl.[2] B05D *7/22*

U.S. Cl. 427—233 **12 Claims**

1. A method of treating a metal automotive hollow body which contains apertures to receive windows or doors with a pretreatment liquid which is capable of rendering the metal of said body resistant to corrosion wherein the body is traversed with respect to a multiplicity of orifices through which the pretreatment liquid is projected at the body and wherein the longitudinal axis of the body is at right angles to its direction of traverse and the body is placed in such relation to the orifices that the major part of the liquid with which the body is treated is projected at an angle to the longitudinal plane of symmetry



of the body within the range 30°–60° and coats the interior and exterior of the body which is rendered resistant to corrosion.

4,205,102

METHOD FOR COATING A CURED POLYALKYLENE RUBBER SUBSTRATE

Pieter H. J. Schuurink, Noordwijk-Binnen, and Arie W. Levering, Haarlem, both of Netherlands, assignors to Akzo N.V., Netherlands

Continuation of Ser. No. 692,862, Jun. 4, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 855,988

Claims priority, application Netherlands, Jun. 9, 1975, 7506793

Int. Cl.[2] B05D *3/00, 5/00, 1/32*

U.S. Cl. 427—393.5 **10 Claims**

1. In a method of coating a pre-treated, cured object of saturated or unsaturated polyalkylene rubber with a liquid coating composition formed from a hydroxyl groups-containing resin and an organic polyisocyanate, the improvement wherein the coating composition comprises a binder which is made up of a polyol component containing at least 60% by weight of polycaprolactone polyol free from ester groups which have the unsaturated residue of acrylic acid having a molecular weight between 250 and 3500 and an organic polyisocyanate, the ratio between the number of hydroxyl groups of the polyol component and the number of isocyanate groups of the polyisocyanate being between 0.8:1 and 1.35:1.

4,205,103

PROCESS USING SAME STABLE FOAM LATEX WITH BUILT-IN SELF GEL MECHANISM AND COATING

Joseph P. Davis, Akron, Ohio, and Julius S. Nagy, Calhoun, Ga., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 14, 1975, Ser. No. 577,491

Int. Cl.[2] B01J *13/00;* **B05D** *3/02*

U.S. Cl. 427—373 **5 Claims**

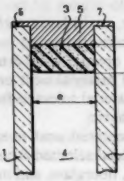
1. A heat sensitive stable gellant system comprising (A) an amphoteric surfactant acid, (B) an ionizable acid, and (C) a water soluble volatile base having a boiling point range of −33° C. to 180° C. at 760 millimeters wherein the amount of the base is sufficient to result in a total gellant system pH of from 8 to 12 wherein the weight ratio of amphoteric surfactant to acid to base is 0.25–5.0/0.25–5.0/0.5–7.5.

3. A process for producing a porous cellular solid foam from a rubber latex comprising adding the gellant system of claim 1 to a rubber latex prior to the addition of the vulcanization agents, foaming the latex, spreading the froth on a suitable textile substrate, drying the froth to form a foam and vulcanizing the foam wherein the amount of amphoteric surfactant acid is 0.25 to 5.0 parts and the amount of ionizable acid is 0.25 to 5.0 parts, all parts being parts by weight per 100 parts by weight of latex solids.

4,205,104
MULTIPLE PANE WINDOW HAVING A THICK SEAL AND A PROCESS AND APPARATUS FOR APPLYING THE SEAL

Pierre Chenel, Enghien les Bains, France, assignor to Saint Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 852,810, Nov. 18, 1977, which is a continuation of Ser. No. 639,787, Dec. 11, 1975, abandoned. This application Jan. 16, 1978, Ser. No. 869,948
Claims priority, application France, Dec. 11, 1974, 74 40824
Int. Cl.² E06B *3/24, 3/26;* C03B *23/24*
U.S. Cl. 428—34 7 Claims

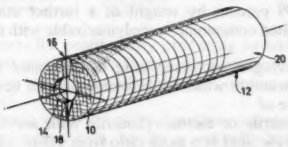


1. A multiple pane window comprising a pair of transparent or translucent sheets with a filamentary seal between the sheets around the periphery of the window, said filamentary seal being formed of a plastic material having a viscosity greater than 115° Mooney at the end of an 8 minute test at 40° C. as measured by a Mooney consistometer, said plastic material consisting essentially of:
Polyisobutylene: 40–70 wt. %
Butyl Rubber: 5–17.5 wt. %
Carbon Black: 10–40 wt. %
Levilite: 0–20 wt. %
Molecular Sieve: 0–5 wt. %.
and in which the ratio by weight of the polyisobutylene to the butyl rubber is between 4 and 8 to 1.

4,205,105
PIPE INSULATION

Kenneth Blundell, Shipley, England, assignor to P. H. Thermal Products Limited, Eldwick, England

Filed Dec. 19, 1977, Ser. No. 862,094
Claims priority, application United Kingdom, Jan. 21, 1977, 2628/77
Int. Cl.² F16L *9/22;* B32B *3/02*
U.S. Cl. 428—36 5 Claims

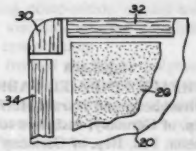


1. Insulation for lagging pipes which comprises a plurality of right cylindrical elements in the form of washers of fibres, said fibres lying substantially in planes perpendicular to the cylindrical axis of said elements, said elements having a bore therein in which said pipe is to be located, and a tubular surface coating of flexible material adhered to said elements holding said elements, said fibres, and said coating together in a predetermined length.

4,205,106
DOORS

Donald J. Perry, Solihull, England, assignor to Perry Bros. (Hall Green) Limited, Birmingham, England

Filed May 3, 1978, Ser. No. 902,337
Claims priority, application United Kingdom, Mar. 3, 1978, 8649/78
Int. Cl.² B60J *5/04*
U.S. Cl. 428—45 2 Claims

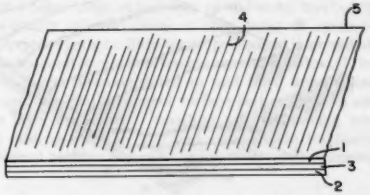


1. A method of making a light weight door comprising locating on a first planar panel a plurality of separate wooden edge parts to form an unconnected and unjointed frame, locating separate blocks of expanded plastics material between selected areas of said frame, said blocks having a thickness greater than that of the wooden edge parts, and locating a second planar panel on the assembly so formed, the frame and the panels being generally rectangular but with at least two adjacent corners of the rectangle radiussed, and bonding the whole assembly together so that the panels become bonded to opposite faces of both blocks and edge parts and so that the blocks are compressed in the direction of their thickness, the bonding being effected between matched dies to impart curvature to each door so that the door is planar at a hinge edge and concave/convex at the opposite longitudinal edge.

4,205,107
ENDLESS COMPOSITE SHEET MATERIAL

Hans Jaschke, Agustin; Rudolf Kautz, Hennef; Hermann Plate, Neunkirchen, and Horst Ulb, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 24, 1978, Ser. No. 954,077
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747978
Int. Cl.² B32B *3/00;* B27M *1/08;* B32B *21/14*
U.S. Cl. 428—58 3 Claims



1. A continuous composite sheet material which comprises a plurality of individual cut-to-size sections bonded together, each of said sections comprising a carrier sheet of a thermally weldable thermoplastic synthetic resin and a decorative genuine wood sheet having a thickenss of about 0.1–0.3 mm, the decorative genuine wood sheet being joined to the carrier sheet by a layer of an adhesive which can be activated in a high-frequency field, said plurality of individual, cut-to-size sections being bonded together at junction zones formed therebetween to provide a continuous decorative wood sheet extending in the longitudinal direction of the composite sheet material, said junction zones being formed along interlocking

edges provided between each adjacent section and each of the genuine wood sheets having a grain direction that extends in the longitudinal direction of the composite sheet material; each genuine wood sheet being microwood; the thermoplastic synthetic resin sheet being an ABS resin, polystyrene, polyethylene terephthalate, polycarbonate, polyamide, styrene-acrylonitrile copolymer or polyvinyl chloride and having a thickness of 0.1–0.5 mm; and the adhesive layer being formed of polyurethane, nitrile rubber, polyvinyl acetate, or a polyester and having a thickness of 0.01–0.1 mm.

4,205,108

SURFACE FINISHED FABRIC

Klaus Schmidt, Hirschberg, and Harald Hoffmann, Mannheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 12, 1977, Ser. No. 796,504

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621141

Int. Cl.[2] **D06N** *7/04;* **B32B** *3/00*

U.S. Cl. 428—147 **3 Claims**

1. A process for the production of a sheet material finished on at least one side with a coherent surface layer, comprising said process consisting essentially of electrostatically spraying onto at least one surface of a rubber bonded support material fibrous substrate a liquid medium containing thermoplastic resinous fiber-forming material which medium upon spraying forms a very fine mat of fibers having a diameter of about 0.1 to 30 microns, and then applying to the mat sufficient heat and pressure to consolidate the fibers to one another and to the substrate while smoothing the surface to form a permeable microporous finished sheet material of high surface luster.

4,205,109

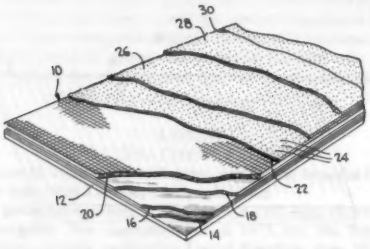
FLEXIBLE ANTI-SKID MATERIAL AND METHOD OF MAKING SAME

Jerry France, Rte. 2, Box 283, Roswell, N. Mex. 88201, and James P. Morgan, Rte. 1, Box 50, Lake Arthur, N. Mex. 88253

Filed Nov. 14, 1978, Ser. No. 960,627

Int. Cl.[2] **B32B** *9/04*

U.S. Cl. 428—150 **15 Claims**



1. A method of making a flexible anti-skid material comprising the steps of:
   (a) coating a hard, smooth substrate with paint;
   (b) placing a flexible carrier material on the coating of paint while the paint is still wet;
   (c) coating the flexible carrier material with paint;
   (d) distributing sand on the coating of paint formed in step (c);
   (e) allowing the anti-skid material to dry; and
   (f) removing the substrate.

4,205,110

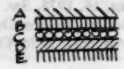
SURFACE COVERINGS FOR WALLS, CEILINGS AND THE LIKE

Raymond W. Jean, 90 LaSalle St., New York, N.Y. 10017

Filed Mar. 14, 1978, Ser. No. 886,512

Int. Cl.[2] **B32B** *7/02, 15/00, 3/26*

U.S. Cl. 428—213 **3 Claims**



2. A flexible, unitary, multi-layer surface covering material for walls and ceilings comprising;
   (a) an outer layer of opaque vinyl 3 to 5 mils thick;
   (b) a second layer of material next ot said outer layer, said second layer of material selected from the group consisting of paper and fabric;
   (c) a third layer of material next to said second layer, said third layer of material selected from the group consisting of polymeric foam, fiberglass, and mineral wool, said third layer being from 1/16 to ¾ inches thick;
   (d) a fourth layer next to said third layer, said fourth layer being aluminum foil with a thickness of 0.00025 to 0.005 inches; and
   (e) a backing layer of material next to said fourth layer, said backing layer of material selected from the group consisting of paper and fabric; said layers being laminated together.

4,205,111

LAMINATES COMPRISING A FOAMED POLYIMIDE LAYER

Wolfgang Pip, Darmstadt, and Klaus Winter, Seeheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,129

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822884; May 26, 1978, 2822885

Int. Cl.[2] **B32B** *5/28, 15/08, 27/08, 27/12*

U.S. Cl. 428—215 **14 Claims**

1. A laminate comprising at least one polyimide foam layer and at least one reinforcing layer bonded thereto, said polyimide foam layer being prepared by foaming an unfoamed polymer containing a blowing agent compatible with said polymer and present therein in an amount sufficient to foam the polymer on heating the polymer at a temperature from 170° C. to 250° C., said unfoamed polymer being obtained by free-radically polymerizing a member selected from the group consisting of
   (I) a mixture of
      (a) 20–99.99 percent by weight of acrylic acid or methacrylic acid,
      (b) 0.01–5 percent by weight of a metal salt of acrylic acid or methacrylic acid,
      (c) 0–79.99 percent by weight of a further ethylenically unsaturated comonomer copolymerizable with (a) and (b), and
      (d) a blowing agent comprising a compound having an amide structure which cleaves ammonia on heating, and
   (II) a mixture of
      (a) acrylonitrile or methacrylonitrile with acrylic acid or methacrylic acid in a mole ratio from 2:3 to 3:2,
      (b) 0–20 percent by weight of (a) of a further ethylenically unsaturated comonomer copolymerizable therewith, and
      (c) 1–15 percent by weight of the sum of (a) and (b) of a monovalent aliphatic alcohol having 3–8 carbon atoms as said blowing agent.

9. The method of making a laminate which comprises pressure bonding at least one reinforcing layer to at least one polyimide foam layer with a heat-hardenable duroplast resin at a temperature of at least 100° C. and under such limitation on

temperature, pressure, and time that at least two of the following three conditions are met:

(i) the hardening temperature is at least 140° C.,

(ii) the compressive pressure is at least 1.0 N/mm^2,

(iii) the hardening time is at least 30 minutes,

said polyimide foam layer being prepared by foaming an unfoamed polymer containing a blowing agent compatible with said polymer and present therein in an amount sufficient to foam the polymer on heating the polymer at a temperature from 170° C. to 250° C., said unfoamed polymer being obtained by free-radically polymerizing a member selected from the group consisting of

(I) a mixture of

(a) 20–99.99 percent by weight of acrylic acid or methacrylic acid,

(b) 0.01–5 percent by weight of a metal salt of acrylic acid or methacrylic acid,

(c) 0–79.99 percent by weight of a further ethylenically unsaturated comonomer copolymerizable with (a) and (b), and

(d) a blowing agent comprising a compound having an amide structure which cleaves ammonia on heating, and

(II) a mixture of

(a) acrylonitrile or methacrylonitrile with acrylic acid or methacrylic acid in a mole ratio from 2:3 to 3:2,

(b) 0–20 percent by weight of (a) of a further ethylenically unsaturated comonomer copolymerizable therewith, and

(c) 1–15 percent by weight of the sum of (a) and (b) of a monovalent aliphatic alcohol having 3–8 carbon atoms as said blowing agent.

4,205,112

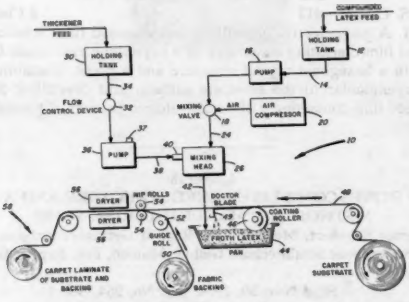
PROCESS FOR FORMING HIGH VISCOSITY COATING COMPOSITIONS FOR FABRIC SUBSTRATES

Gaillard A. Mervin, Concord, N.C., assignor to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,440

Int. Cl.^{2} B05D *3/02*; B32B *27/00*; C08F *37/08*

U.S. Cl. 428—245 **8 Claims**



1. A process for continuously producing variable high viscosity butadiene-styrene frothed coating compositions from a prepared low viscosity butadiene-styrene coating composition consisting of:

(a) preparing a low viscosity butadiene-styrene polymeric coating composition having a viscosity ranging from about 1000 cps to about 12,000 cps from a low viscosity butadiene-styrene emulsion polymer resin having an alkaline pH range from about 7.5 to 10.5;

(b) flowing the thus formed low viscosity alkaline polymeric coating composition into a high speed froth producing mixing zone;

(c) mixing said low viscosity butadiene-styrene polymeric coating composition as it passes through said mixing zone and during mixing injecting at a selected rate of flow an acid-type polymeric thickener emulsion into the flow of said low viscosity alkaline polymeric coating composition to produce the desired high viscosity frothed coating composition exiting from said mixing zone and having a pH in the alkaline range, said frothed coating composition having an increased viscosity of from about 12,000 cps to about 25,000 cps;

(d) changing when desired the selected rate of flow of the acid-type polymeric thickener emulsion injected into said low viscosity alkaline butadiene-styrene polymeric coating composition being mixed to produce a different high viscosity coating composition in said mixing zone from the same low viscosity alkaline butadiene-styrene polymeric coating composition;

(e) flowing said frothed thickened polymeric composition having said desired high viscosity from said mixing zone to a fabric coating applicator means; and

(f) applying continuously to the surface of a carpet backing substrate the high viscosity frothed coating composition produced.

8. A fabric substrate coated by the process of claim 1 in which said fabric substrate is a carpet including a fabric backing adhesively secured to said carpet by said high viscosity butadiene-styrene coating composition.

4,205,113

FASHION FELT

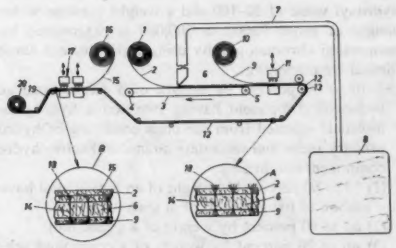
Hans O. Hermansson, Halmstad, and Bror E. Jönsson, Simlangsdalen, both of Sweden, assignors to Nordifa Industritextilier AB, Halmstad, Sweden

Filed Mar. 30, 1978, Ser. No. 891,499

Claims priority, application Sweden, Apr. 7, 1977, 7704121

Int. Cl.^{2} B32B *5/02*

U.S. Cl. 428—286 **5 Claims**



1. An improved fashion felt comprising a first outer layer and a second outer layer, at least one of said outer layers consisting essentially of melt fibres, a third layer of synthetic fibres, preferably synthetic fibre waste, positioned intermediate said first and second layers thus separating said layers, said first and second layers interconnected to said third intermediate layer by needling, and a layer of surface batt secured to said first outer layer by means of needling, said felt having been given the desired shape in heat and compression treatments and the desired outlines through cutting, preferably stamping.

4,205,114

HEAT AND GREASE RESISTANT CONTAINERS COMPRISING POLY (P-METHYLSTYRENE)

Peter J. Canterino, Towaco, and Harold A. Arbit, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 943,416, Sep. 18, 1978, abandoned. This application Nov. 16, 1978, Ser. No. 961,353

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 428—315 **8 Claims**

1. Thermoformed and irradiated with ionizing radiation at a dose between about 30 megarads and about 70 megarads

shaped articles of poly (p-methylstyrene) for use as food containers which are resistant to fats.

4,205,115

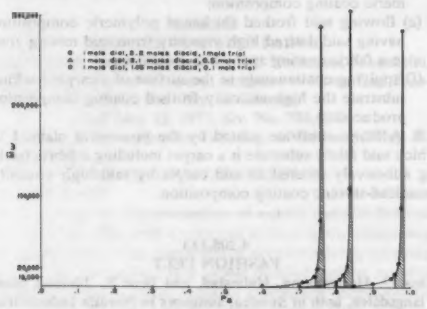
POLYESTER COATING COMPOSITION

Robert M. Piccirilli, Pittsburgh; Wen-Hsuan Chang; David T. McKeough, both of Gibsonia, and Samuel Porter, Jr., Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 19, 1978, Ser. No. 897,963

Int. Cl.[2] B32B *27/40, 27/06, 27/36*

U.S. Cl. 428—334 **25 Claims**



1. In a coating composition comprising a resinous binder and optionally pigment and diluent in an amount sufficient to provide the coating composition with a sufficient viscosity for coating, the improvement comprising:

using as the resinous binder an ungelled polyester having a hydroxyl value of 10–160 and a weight average molecular weight of about 50,000 to 300,000 as determined by gel permeation chromatography using a polystyrene standard, formed from reacting:

(A) 10 to 70 percent by weight of a difunctional active hydrogen component having two active hydrogens per molecule selected from the class consisting of hydroxyl, primary amine and secondary amine, said active hydrogen component comprising:

(1) 10 to 60 percent by weight of an acrylic diol having a carbon to oxygen ratio of at least 2,

(2) up to 60 percent by weight of a cyclic diol,

(3) up to 20 percent by weight of a compound selected from the class consisting of diamines and hydroxyl-containing amines;

(B) 25 to 85 percent by weight of a dicarboxylic acid component comprising:

(1) 5 to 85 percent by weight of an acyclic dicarboxylic acid containing from 2 to 36 carbon atoms,

(2) up to 80 percent by weight of a cyclic dicarboxylic acid;

(C) up to 30 percent by weight of an active hydrogen component having at least three active hydrogens per molecule, the active hydrogens being selected from the class consisting of hydroxyl, primary amine, secondary amine and carboxylic acid;

(D) up to 20 percent by weight of a monoamino monocarboxylic acid;

the percentages by weight being based on total weight of (A), (B), (C) and (D), the percentages of the reactants being adjusted such that the weight percentages of cyclic moieties in said polyester plus the weight percentages of amide moieties formed in said polyester multiplied by 4 is up to 35 and the weight percentages of the reactants being further adjusted such that these reactants contain about 0.01 to 1.0 gram-mole of reactants having a functionality of 3 or more per 500 grams of reactants.

9. The composition of claim **1** in combination with a curing agent.

10. The composition of claim **9** in which the curing agent is selected from the class consisting of aminoplast and polyisocyanates.

12. A coated article comprising:

(A) a substrate and as a coating thereon

(B) the cured resinous composition of claim **10**.

13. The coated article of claim **12** in which the coating has a thickness of 0.1 to 5 mils.

4,205,116

FLUORESCENT X-RAY IMAGE INTENSIFYING SCREEN

Willy K. Van Landeghem, Sint-Gillis-Waas, and André R. Suys, Hove, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 18, 1978, Ser. No. 897,438

Claims priority, application United Kingdom, May 6, 1977, 19118/77

Int. Cl.[2] G03B *11/00;* **G21K** *3/00;* **H05G** *1/00;* **G01D** *15/14*

U.S. Cl. 428—409 **13 Claims**

1. X-ray image intensifying screen including at least one fluorescent layer comprising phosphor particles dispersed in a binder and on top of such layer a protective layer containing a crosslinked polymer mass obtained by an acid-catalyzed reaction of a polymer or mixture of polymers containing reactive hydrogen atoms and a crosslinking agent, the crosslinking agent being an organic compound containing a plurality of etherified N-methylol groups.

4,205,117

PIEZOELECTRIC CRYSTALLINE FILM OF ZINC OXIDE AND METHOD FOR MAKING SAME

Hiroshi Nishiyama, Mukou; Toshio Ogawa, and Tasuku Mashio, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 7, 1978, Ser. No. 940,335

Claims priority, application Japan, Sep. 13, 1977, 52-110892

The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.

Int. Cl.[2] C23C *13/00;* **C04B** *35/00*

U.S. Cl. 428—411 **4 Claims**

1. A piezoelectric crystalline film disposed on a substrate, said film consisting essentially of a crystalline zinc oxide film with a hexagonal crystal structure and a c-axis substantially perpendicular to the substrate surface, said crystalline zinc oxide film containing 0.01 to 20.0 atomic percent of phosphorus.

4,205,118

HONEYCOMB-LIKE PANEL STRUCTURE AND A METHOD FOR MANUFACTURING SAME

Gernot Schubert, Munich, Fed. Rep. of Germany, assignor to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,896

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1977, 2754776

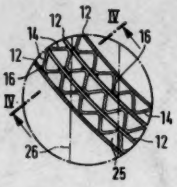
Int. Cl.[2] B23P *3/22;* **B32B** *3/12*

U.S. Cl. 428—594 **9 Claims**

1. A honeycomb-like structure comprising a plurality of layers each including two sheet metal panels, at least one of the panels in each layer being of undulating configuration and the panels engaging each other along multiple line contacts at the apexes of the undulations, affording a multiplicity of small channels extending through the structure parallel to the undulations of the one panel, characterized by the fact that the panels are joined together at a frontal surface, transverse to the channels, by a multiplicity of localized beam-welded joints limited to the contact portions of the panels immediately adjacent the frontal surface.

3. The method for the fabrication of a honeycomb-like struc-

ture from a plurality of sheet metal panels having large lateral surfaces which contact each other at a multiplicity of points and form a multiplicity of channels extending in a predetermined direction, characterized by the fact that the panels are



bonded at limited contact point areas which abut a frontal surface extending transversely to the holes, by a focused corpuscular beam which is directed with such orientation toward the frontal surface that it substantially extends essentially longitudinally of the channels.

4,205,119

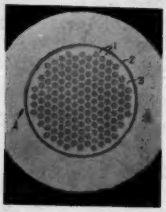
WRAPPED TANTALUM DIFFUSION BARRIER

Morris S. Young, Murray Hill, N.J., and David C. Larbalestier, Madison, Wis., assignors to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 920,616, Jun. 29, 1978, abandoned. This application Aug. 14, 1978, Ser. No. 933,302

Int. Cl.[2] B21C *37/12;* **H01L** *39/06*

U.S. Cl. 428—614 **3 Claims**



1. A stabilized multifilamentary superconductor wherein the superconductive material is of the type A_3B, is selected from the group consisting of Nb_3Sn and V_3Ga, and is formed by diffusion of the B mateial from a matrix of an alloy of Cu and the B material onto the surfaces of wires or filaments of the A material embedded therein, and wherein the improvement comprises providing a quantity of a stabilizing metal on the external surface of the conductor selected from the group consisting of Ag, Au, Al and Cu and isolating this stabilizing metal from diffusion of the B material by providing a wrapped diffusion barrier consisting of at least one essentially complete layer, having substantial layer overflap, of a refractory metal foil impermeable to tin between the central matrix and the stabilizing metal, the overlapping portions of said layer being separated from one another by an interleaved foil of a metal softer than the refractory metal.

2. A stabilized multifilamentary superconductor, comprising: a central matrix consisting essentially of a plurality of Nb rods in a Cu/Sn matrix, Nb_3Sn having been formed at the interface of the matrix and the Nb rods;

a quantity of stabilizing Cu on the external surface of the conductor; and

a barrier interposed between the matrix and the stabilizing Cu, the barrier comprising at least two nominally complete layers of a refractory metal foil, said layers having been formed by wrapping a continuous length of said foil around the matrix, and said layers being separated from one another by interleaved Cu foil.

4,205,120

MAGNETIC RECORDING ELEMENT

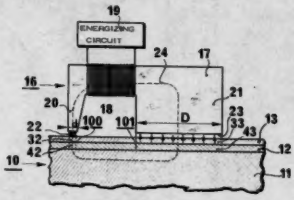
Henri Morizot, and Andre Lucan, both of Belfort, France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Aug. 18, 1978, Ser. No. 934,849

Claims priority, application France, Sep. 7, 1977, 77 27073

Int. Cl.[2] B32B *15/00;* **G11B** *5/00*

U.S. Cl. 428—676 **14 Claims**



1. A magnetic recording element for use in a data storage unit provided with at least a magnetic recording head for recording information signals on said element, said recording element comprising:

a metal carrier of high magnetic permeability having a first and a second layer of material thereon, said first layer being disposed on said carrier intermediate the carrier and the second layer and being a non-ferrous non-magnetic conductive metal having a thickness between 20 and 40 microns, and said second layer being of magnetic material disposed on said intermediate layer.

6. A magnetic recording element according to claim 4 wherein the metal of the first intermediate layer is copper, aluminum, silver, gold or zinc.

8. In a data storage unit the combination comprising a magnetic recording element and a row of magnetic recording heads associated therewith for recording information signals on said element, each said head including an electromagnet having a core and a winding wound on said core and connected to an energizing circuit to receive information signals sent by the circuit, each said core having a recording pole and a flux-closing pole the recording pole and flux-closing pole each having a pole face, the cross section of the pole face of the recording pole being smaller than that of the pole face of the flux-closing pole, said magnetic recording element comprising:

a metal carrier of high magnetic permeability having a first and a second layer of material thereon, said first layer being disposed on said carrier intermediate the carrier and the second layer and being a non-ferrous non-magnetic conductive metal having a thickness between 20 and 40 microns, and said second layer being of magnetic material disposed on said intermediate layer.

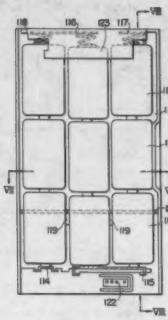
11. In a data storage unit, the combination comprising a magnetic recording element and a row of magnetic recording heads for recording information signals on said element, each said head including an electromagnet having a core and a winding wound on said core and connected to an energizing circuit to receive information signals sent by said circuit, each said core having a recording pole and a flux-closing pole, the cross-section of the pole face of the recording pole being smaller than that of the pole face of the flux-closing pole, said magnetic element comprising:

a rotatable metal cylinder of high magnetic permeability having a first and a second layer thereon, said first layer being disposed on said cylinder intermediate the cylinder and the second layer and being a non-ferrous non-magnetic conductive metal, said first layer having a thickness between 20 and 40 microns, and said second layer being a magnetic material deposited on said intermediate layer.

4,205,121
STORAGE COMPARTMENT

Yasuo Naitoh, Kamakura, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 20, 1978, Ser. No. 962,189
Claims priority, application Japan, Nov. 25, 1977, 52-158790[U]
Int. Cl.² H01M 2/10
U.S. Cl. 429—99 10 Claims



1. A battery storage compartment for selectively storing cylindrical batteries or another battery of the type having a non-cylindrical end and a length different from that of said cylindrical batteries, said battery storage compartment comprising:

a compartment member having first and second opposite end walls and a bottom portion interposed therebetween;

electrically conductive spring means secured to said first end wall and extending toward said second end wall;

electrically conductive means located at said second end wall; and

an abutment member attached to said compartment member projecting from said bottom portion at a location intermediate said first and second end walls and extending in a direction parallel thereto, said abutment member having a cutout portion therein and spaced rib members extending toward said second end wall;

said cylindrical batteries, when stored, fitting within the cutout portions of said abutment member and between said spaced rib members in electrical contact with said spring means, said cylindrical batteries being urged by said spring means toward said electrically conductive means; said another battery, when stored, having its non-cylindrical end supported by said abutment means and its other end electrically connected to said spring means, said another battery being urged by said spring means and toward said abutment means.

4,205,122
BATTERY SEPARATOR AND METHOD FOR BATTERY SEPARATION

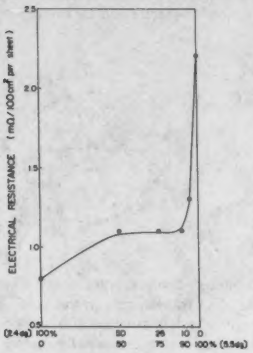
Yoshikazu Miura, Ichihara, and Yoshifumi Ichikura, Ageo, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,293
Claims priority, application Japan, Apr. 26, 1978, 53-48747
Int. Cl.² H01M 2/16
U.S. Cl. 429—144 16 Claims

1. A battery separator comprising a self-supporting nonwoven mat consisting essentially of a mixture of

(A) olefinic resin flash-spun fibers having a coarseness of from 4.5 to 13 decigrex,

(B) olefinic resin flash-spun fibers having a coarseness of less than 4 decigrex to 1 decigrex in an amount of about 3 parts to about 70 parts by weight per 100 parts by weight of fibers (A) and

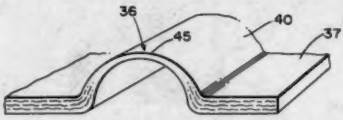


(C) inert filler materials in an amount of 0 to about 600 parts by weight per 100 parts by weight in total of fibers (A) and (B).

4,205,123
BATTERY SEPARATOR WITH POROUS BODY AND FUSED RIB

Nigel I. Palmer, Lexington, and Don O. Grammer, Scituate, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 317,107, Dec. 21, 1972, Pat. No. 4,003,758. This application Sep. 30, 1976, Ser. No. 728,341
Int. Cl.² H01M 2/16
U.S. Cl. 429—147 7 Claims



1. A battery separator comprising a nonwoven mat, said nonwoven mat comprised of plastic fibers and having a first region with interstices between said plastic fibers rendering said nonwoven mat porous and a second region extending outwardly of said first region, the plastic fibers at the outer extremity portion of said second region being fused rendering said outer extremity of said second region of said nonwoven mat imporous.

4,205,124
LOW GAMMA PHOTOGRAPHIC DEVELOPER

Harvey A. Hodes, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 876,444, Feb. 9, 1978, abandoned. This application Jan. 12, 1979, Ser. No. 3,056
Int. Cl.² G03C 5/30, 5/38
U.S. Cl. 430—456 4 Claims

1. A photographic developer composition for processing aerial-type film to a gamma less than 1, said composition consisting of 1 gram of 1-phenyl-3-pyrazolidone and 2 grams of hydroquinone as the sole developing agents, and sufficient water to make one liter, the composition also contains sufficient alkali to provide a pH ranging from about 9.8 to 10.4.

4,205,125

PROCESS FOR THE PRODUCTION OF COENZYME Q

Ko Aida, No. 681-2, Oazanegishi, Urawa-shi, Saitama-ken; Kinya Uchida, Mitaka, and Izumi Kawada, Yokohama, all of Japan, assignors to Ko Aida, Urawa, Japan

Continuation-in-part of Ser. No. 935,267, Aug. 21, 1978, abandoned. This application Jan. 25, 1979, Ser. No. 6,376
Claims priority, application Japan, Sep. 5, 1977, 52-105939
Int. Cl.[2] C12P *7/66*
U.S. Cl. 435—133 9 Claims

1. In the process for producing Coenzyme Q_8–Q_{10} which comprises

cultivating a microorganism belonging to the genus Pseudomonas in a culture medium to produce Coenzyme Q_8–Q_{10}, and then recovering said Coenzyme Q_8–Q_{10} from the cultivated culture medium,

the improvement comprising admixing in said culture medium at least one member selected from the group consisting of isopentenyl alcohol, dimethyl allyl alcohol, geraniol, isopentenyl acetate, dimethyl allyl acetate, geranyl acetate and β-methyl crotonic acid.

4,205,126

SERUM-FREE CELL CULTURE MEDIA

Oscar A. Cartaya, 6 Soldiers Field Park, Apartment 319, Boston, Mass. 02163

Continuation-in-part of Ser. No. 951,500, Oct. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 866,338, Jan. 1, 1978, abandoned. This application Dec. 14, 1978, Ser. No. 969,590
Int. Cl.[2] A01N *1/02*
U.S. Cl. 435—2 13 Claims

1. An MEM zinc option medium wherein the amino acid profile is about as follows:

Item	Amount (milligrams per liter)
L alanine	8.9
L asparagine	75.0
L aspartic acid	13.0
L glutamic acid	14.7
L glycine	7.5
L proline	11.5
L serine	52.5
L arginine HCl	196.52
L cystine	37.2
L glutamine	584.0
L histidine HCl	65.0
L isoleucine	80.88
L leucine	160.88
L lysine	112.38
L methionine	23.30
L phenyl-alanine	50.15
L threonine	74.18
L tryptophan	15.61
L valine	71.4
L tyrosine	45.9

4,205,127

PROCESS FOR THE RENEWAL OF AN INSOLUBILIZED GLUCOSE ISOMERASE

Yoshimasa Fujita, Tokyo; Akiyoshi Matsumoto, Hino; Isao Miyachi; Nobuo Imai, both of Higashiyamato; Isao Kawakami, Machida; Tadashi Hishida, Tokyo, and Akira Kamata, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited and Seikagaku Kogyo Company, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 780,843, Mar. 24, 1977, Pat. No. 4,113,568. This application Jun. 20, 1978, Ser. No. 917,256
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.[2] C12N *11/12, 11/08, 11/10*
U.S. Cl. 435—179 15 Claims

1. A process for the renewal of an insolubilized glucose isomerase comprising the steps of:

(1) desorbing the adsorbed materials from an insolubilized glucose isomerase by treating sequentially with an aqueous mineral acid in combination with an aqueous alkali solution, an aqueous electrolytic salt solution, an aqueous mineral acid or a mixture thereof, said insolubilized isomerase being glucose isomerase adsorbed on and bonded to a supporter of synthetic anion exchange resin and having been used in the isomerization of glucose into fructose,

(2) converting said supporter resin into a salt type to regenerate the supporter, and

(3) adsorbing fresh glucose isomerase on the regenerated supporter.

4,205,128

PROCESS FOR PRODUCING IMMOBILIZED ENZYME COMPOSITIONS

Yoshiaki Ishimatsu, Machida; Shigeki Shigesada, Sagamihara; Hiroyasu Suzuki, Tokyo; Hironoshin Kitagawa, and Shoji Kimura, both of Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 781,921, Mar. 28, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 936,773
Claims priority, application Japan, Mar. 31, 1976, 51/35471
Int. Cl.[2] C07G *7/02*
U.S. Cl. 435—182 13 Claims

1. A process for producing an immobilized enzyme composition which comprises the steps of

reacting enzyme and/or enzyme containing microorganic cells with a cross-linking agent and an anionic exchange high molecular substance containing a quaternary pyridine ring in the molecule at a weight ratio of the enzyme and/or enzyme containing microorganic cells to the anionic exchange high molecular substance of between 1:0.005 and 1:0.05, in an aqueous dispersion having a pH range of from about 5 to 9, at a temperature from about 0° C. to about 30° C,

adjusting the water contents of the resulting reaction products to from about 25 to about 80 wt.%,

subjecting to extrusion molding the adjusted reaction products with an extruder at a temperature from about 0° C. to 25° C., thereby obtaining an extrudate,

pelletizing said extrudate, and then

drying the pellets at a temperature from about 40° C. to 80° C. for about 15 minutes to 20 hours.

4,205,129

METHOD FOR PURIFYING GALACTOSYLTRANSFERASE ISOENZYMES AND PRODUCT

Daniel K. Podolsky, Boston, Mass., and Milton M. Weiser, Buffalo, N.Y., assignors to The Massachusetts General Hospital, Boston, Mass.

Filed Mar. 5, 1979, Ser. No. 17,288
Int. Cl.[2] C07G 7/026
U.S. Cl. 435—193 6 Claims

1. A composition of matter derived from the body fluids of animals having cancer or from extracts of malignant cells or tumor which comprises:

a galactosyltransferase isoenzyme having a molecular weight of about 71,000 and having an activity of at least about 1×10^5 pmole/mg protein/60 min.

4,205,130

METHOD OF PURIFICATION OF HUMAN PROSTATIC ACID PHOSPHATASE

Pirkko Vihko, Jaakonkuja 1 E 3, 90230 Oulu 23, Finland

Filed Mar. 12, 1979, Ser. No. 19,644
Int. Cl.[2] B01D 15/08
U.S. Cl. 435—196 10 Claims

1. A method of purification of human prostatic acid phosphatase, which comprises the steps of:

(a) treating a solution containing acid phosphatase by means of affinity chromatography by introducing said solution into a column packed with an agarose gel coupled with tartrate groups, by passing an eluent through said column and by collecting the eluate as successive fractions, and

(b) subjecting a portion of the eluate containing said phosphatase to a further treatment by means of isoelectric focusing, whereby the phosphatase is divided into its isoenzymes.

4,205,131

VIRUS PROPAGATION

June D. Almeida, London, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Nov. 30, 1978, Ser. No. 965,045
Claims priority, application United Kingdom, Dec. 1, 1977, 50094/77; Dec. 24, 1977, 53906/77
Int. Cl.[2] C12N 7/00
U.S. Cl. 435—235 7 Claims

1. A method of propagating rotavirus in vitro comprising growing the virus in cell cultures susceptible to the virus in the presence of a serum-free medium containing a proteolytic enzyme.

4,205,132

LYOPHILIZATION OF BACTERIA

William E. Sandine, Corvallis, Oreg., and Ebenezer R. Vedamuthu, Bradenton, Fla., assignors to Microlife Technics, Inc., Sarasota, Fla.

Filed Jul. 17, 1978, Ser. No. 925,034
Int. Cl.[2] C12K 1/08, 3/00; A23C 19/02
U.S. Cl. 435—260 6 Claims

1. The method of producing a storage stable lyophilized bacterial product which comprises:

(a) providing acid producing bacteria mixed with a lyophilizing composition consisting essentially of at least about five percent by weight of the bacteria of an alkali metal glycerophosphate as a buffering agent in an aqueous medium including milk solids which has a pH between about 6 and 8 without the bacteria;

(b) rapidly freezing the bacteria in a sealable container;

(c) lyophilizing the bacteria with a vacuum in a sealed chamber to remove water wherein the bacteria contain less than five percent by weight water as a result of lyophilization; and

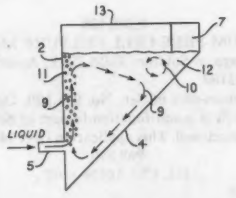
(d) surrounding the bacteria with argon which is essentially free of oxygen and sealing the container, wherein at least about ten percent of the bacteria surviving lyophilization remain viable for 90 days.

4,205,133

APPARATUS FOR FERMENTING LIQUIDS

Emil Wick, San Pablo, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,371
Int. Cl.[2] C12M 1/00
U.S. Cl. 435—287 2 Claims



1. An apparatus for fermenting liquids, which comprises

a rear member disposed to the horizontal at an angle of about 90°–160°,

two vertical side members attached to said rear member,

a front member attached to said vertical side members and said rear member at its base, said front member being disposed to the horizontal at an angle of about 20°–70°, the angular disposition between said rear member and said front member being no less than 20° and no more than 140°, the apparatus thus having a horizontal cross-sectional area at its base substantially less than the horizontal cross-sectional area at its top,

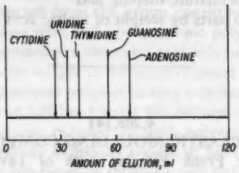
means for introducing liquids to be fermented into the apparatus attached to the base of the apparatus, said means cooperating with said rear member, said vertical side members, and said front member to create within the fermenting liquid two turbulent zones and a non-turbulent zone, the flow patterns of the liquid within the turbulent zones being opposite and upward for a part of the time, horizontal for a part of the time, and slant for a part of the time, and

means for removing fermented liquid from the apparatus at the top of the apparatus.

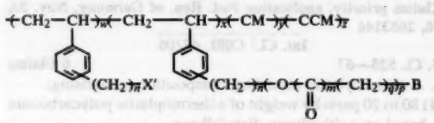
4,205,134
CARRIER FOR LIQUID CHROMATOGRAPHY

Toru Seita; Akihiko Shimizu; Yoshio Kato, and Tsutomu Hashimoto, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Company, Ltd., Yamaguchi, Japan

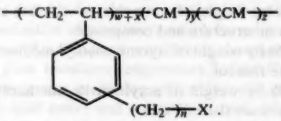
Division of Ser. No. 849,466, Nov. 7, 1977, Pat. No. 4,128,706.
This application Jun. 30, 1978, Ser. No. 920,988
Claims priority, application Japan, Nov. 9, 1976, 51-133761; Nov. 12, 1976, 51-135276
The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.
Int. Cl.[2] C08J *9/00*
U.S. Cl. 521—53 11 Claims



1. A carrier for liquid chromatography having main units



wherein n=0 or an integer of 1 to 3; m=0 or 1; q=an integer of 1 to 3; p=0 or 1; w=90 to 16; x=57 to 2, y=0 to 30 and; z=5 to 30; B represents adenine, guanine, thymine, uracil or cytosine; X' represents OH, Cl, Br or I; CM represents styrene, a substituted styrene, acrylonitrile, a substituted acrylonitrile, acrylic acid or a substituted acrylic acid and CCM represents crosslinking agent having two or more unsaturated groups, which is prepared by reacting a nucleic acid base or a derivative thereof with a porous gel having main units



4,205,135
CLOSED CELL PHENOLIC FOAM

John H. Beale, and Ernest K. Moss, both of St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Mar. 18, 1976, Ser. No. 668,066
The portion of the term of this patent subsequent to Jul. 6, 1993, has been disclaimed.
Int. Cl.[2] C08J *9/02*
U.S. Cl. 521—116 42 Claims

1. A process for producing a closed cell phenolic-resin foam, said process comprising reacting phenolic-resin foam forming reactants in the presence of a blowing agent and a surfactant that:

a. is branched,
b. is non-ionic,
c. has a hydroxyl value less than 50,
d. has its hydroxyl groups, which would otherwise give the surfactant a higher hydroxyl value, capped.

4,205,136
PROCESS FOR PRODUCING A RIGID POLYURETHANE FOAM HAVING EXCELLENT FLAME RETARDANCE AND LOW-SMOKE DEVELOPMENT

Takashi Ohashi, Iruma; Minoru Kojima, Ohme; Masako Yoshida, Kodaira; Toru Okuyama, Sagamihara, and Ryozo Sakata, Higashiyamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

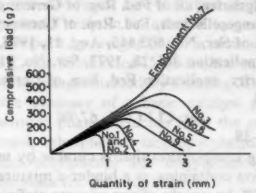
Filed Feb. 21, 1979, Ser. No. 13,751
Claims priority, application Japan, Feb. 21, 1978, 53-18080
Int. Cl.[2] C08G *18/14, 18/32, 18/26*
U.S. Cl. 521—118 15 Claims

1. In a process for producing a rigid polyurethane or polyisocyanurate foam having excellent flame-retardance and low-smoke development by reacting a polyhydroxyl compound with an organic polyisocyanate in the presence of a blowing agent, a surfactant and a catalyst, the improvement comprising using 3-methyl-pentane-1,3,5-triol in admixture with said polyhydroxyl compound, in an amount of 0.2–2.0 equivalent of said triol per equivalent of said polyhydroxyl compound.

4,205,137
BASIC MATERIAL FOR MAKING A POROUS MATERIAL FOR SEALS

Osamu Akiyama, Kobe, Japan, assignor to Bando Chemical Industries, Ltd., Hyogo, Japan

Filed Aug. 1, 1977, Ser. No. 820,943
Claims priority, application Japan, May 2, 1977, 52-51050
Int. Cl.[2] C08J *9/36*
U.S. Cl. 521—145 6 Claims



1. A moldable composition for making a porous stamp, which composition is made by a process comprising:

(a) forming a polyvinylchloride plastisol from polyvinylchloride and a plasticizer;
(b) foaming the plastisol of step a);
(c) gelating or semigelating the foamed plastisol of step b), said gelated or semigelated foam having an apparent specific gravity of 0.3–0.5; and
(d) pulverizing the gelated or semigelated foamed plastisol of c).

4,205,138
POLYURETHANE FOAMS AND ELASTOMERS PREPARED FROM LOW MOLECULAR WEIGHT POLYHYDROXYL COMPOUNDS

Hanns P. Müller, and Küno Wagner, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 934,567, Aug. 17, 1978, Pat. No. 4,156,636.
This application May 10, 1979, Ser. No. 38,033
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738512
Int. Cl.[2] C08G *18/14, 18/32*
U.S. Cl. 521—158 1 Claim

1. A process for the preparation of cellular or non-cellular polyurethane resins by the reaction of

(a) polyisocyanates with
(b) compounds containing at least 2 active hydrogen atoms

and having a molecular weight of from 32 to 400, optionally

(c) compounds containing at least 2 active hydrogen atoms and having a molecular weight of from 400 to 10,000, and optionally

(d) blowing agents, catalysts and other known additives, characterized in that the compounds used as component (b) are low molecular weight polyhydroxyl compounds prepared by condensing formaldehyde hydrate in the presence of calcium hydroxide as catalyst and in the presence of compounds capable of enediol formation as co-catalyst, adjusting a formaldehyde-containing solution of the co-catalyst in water to a pH value of from 9 to 12 by the addition of calcium hydroxide at a temperature of from 80° to 110° C. so that condensation of the formaldehyde hydrate is started, and then adding to this reaction mixture,

(1) an aqueous formalin solution and/or paraformaldehyde dispersion containing from 20 to 65%, by weight, of formaldehyde, and

(2) calcium hydroxide at such a rate that the reaction mixture is maintained at a pH value of from 7.5 to 9.5 at a temperature of from 80° to 110° C., the concentration of formaldehyde being maintained at from 0.5 to 10%, by weight, based on the total reaction mixture, throughout the condensation reaction.

4,205,139

CURABLE COATING COMPOSITION

Helmut Barzynski, Bad Durkheim; Heinrich Hartmann, Limburgerhof; Dieter Lautenbach, Schifferstadt; Rolf Osterloh, Ludwigshafen; Lutz Goethlich, Ludwigshafen, and Guenter Heil, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 603,445, Aug. 11, 1975, abandoned. This application Jul. 28, 1977, Ser. No. 819,816

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1974, 2441148

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—38 **7 Claims**

1. A coating composition that is curable by means of high energy radiation containing as a binder a mixture of

(A) 70 to 97% by weight of one or more olefinically polyunsaturated esters with a molecular weight of from 70 to 20,000 and a boiling point above 50° C., and

(B) 30 to 3% by weight of one or more compounds copolymerizable with (A) but different therefrom, with a molecular weight of from 110 to 2,000, and carrying at least two N-vinyl groups and at least one carbonyl group, each nitrogen of the N-vinyl groups being bonded to a carbonyl group, said carbonyl group in turn being bonded to a nitrogen or carbon atom.

4,205,140

THERMOPLASTIC MOULDING COMPOSITIONS

Lothar Liebig; Frank Wingler, both of Leverkusen; Dieter Margotte, and Werner Nouvertne, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,628

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653143

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—67 **4 Claims**

1. A thermoplastic moulding composition comprising:

(1.) 80 to 20 parts by weight of a thermoplastic polycarbonate based on a dihydroxy diaryl alkane,

(2.) 20 to 80 parts by weight of a graft polymer of

2.2. a monomer mixture, polymerised onto

2. a diene rubber with a glass transition temperature below −30° C., said monomer mixture consisting of

2.2.1. 95 to 50% by weight of styrene, methyl methacrylate or a mixture thereof; and

2.2.2. 50 to 5% by weight of acrylonitrile, methacrylonitrile or a mixture thereof,

the ratio by weight of rubber (2.1) to monomer mixture (2.2.) being in the range of from 80:20 and 10:90, and the moulding composition containing from 5 to 35% by weight of the rubber (2.1), and

(3.) 5 to 75 parts by weight of a copolymer which is chemically uniform in structure and which comprises:

3.1 93 to 50 parts by wieght of styrene, methyl methacrylate or a mixture thereof;

3.2 40 to 5 parts by weight of acrylonitrile, methacrylonitrile or a mixture thereof; and

3.3 2 to 30 parts by weight of maleic acid anhydride.

4,205,141

THERMOPLASTIC MOULDING COMPOSITIONS

Lothar Liebig; Frank Wingler, both of Leverkusen; Gert Humme, Odenthal, and Richard Prinz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,630

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1976, 2653146

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—67 **6 Claims**

1. A thermoplastic moulding composition comprising:

(1) 80 to 20 parts by weight of a thermoplastic polycarbonate based on a dihydroxy diarylalkane,

(2) 0 to 60 parts by weight of a graft copolymer of a

(2.2) monomer mixture of

(2.2.1) 95 to 50% by weight of styrene, methyl methacrylate or a mixture thereof; and

(2.2.2) 50 to 5% by weight of acrylonitrile, methacrylonitrile or a mixture thereof,

polymerised onto

(2.1) a rubber which has a glass temperature below −20° C., and which contains less than 30 C=C-double bonds per 1000 carbon atoms, the moulding composition containing from 0 to 35% by weight of the rubber (2.1), and

(3) 5 to 75 parts by weight of a copolymer which is chemically uniform in structure and comprises:

(3.1) 95 to 50% by weight of styrene, methyl methacrylate or a mixture thereof;

(3.2) 40 to 5% by weight of acrylonitrile, methacrylonitrile or a mixture thereof; and

(3.3) 2 to 30% by weight of maleic acid anhydride, the sum of 3.1, 3.2 and 3.3 being equal to 100% by weight.

4,205,142

FLAME RETARDANT RESIN COMPOSITIONS

Massimo Baer, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 2, 1977, Ser. No. 847,959

Int. Cl.[2] C08L *67/06*

U.S. Cl. 525—166 **17 Claims**

1. A resin composition comprising

A. a thermoplastic polyester;

B. an effective amount of a halogenated flame retardant additive; and

C. an effective amount of a flame retardant synergist of average particle size less than about 2 microns, wherein the particles of the synergist are substantially occluded with a non-blocking rubber.

4,205,143

MIXTURES OF POLYCATIONIC AND POLYANIONIC POLYMERS FOR SCALE CONTROL

Richard M. Goodman, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 766,329, Feb. 7, 1977. This application Nov. 13, 1978, Ser. No. 960,216

Int. Cl.[2] C08L 33/02

U.S. Cl. 525—213 5 Claims

1. A magnesium scale inhibiting composition comprising a polyanionic polymer containing at least about 50 mole percent of repeating units derived from an acrylic acid and any balance of repeating units derived from one or more monomers compatible therewith, the acid units being in the form of at least one member selected from the group consisting of free acid radical, ammonium salts, and a polycationic polymer of poly(-dimethyldiallylammonium chloride), said polyanionic polymer having a molecular weight in the range of about 500 and about 50,000 said polycationic polymer having a molecular weight in the range of about 1,500 and about 500,000 and the molar ratio of said polycationic polymer to said polyanionic polymer based on the average molecular weight of the repeating units therein being in the range of about 2:1 and 25:1.

4,205,144

PREPARATION OF GRAFT COPOLYMERS

Herbert Naarmann, Wattenheim; Graham E. McKee, Ludwigshafen, and Burghard Schmitt, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,801

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749579

Int. Cl.[2] C08L 51/04

U.S. Cl. 525—273 1 Claim

1. A process for the preparation of graft copolymers by polymerization of monomers which form hard polymers in the presence of a saturated crosslinked elastomeric polymer having a glass transition temperature below 0° C. and selected from the group consisting of acrylate polymers consisting of acrylic acid esters and mixtures thereof, with up to 30% by weight of other unsaturated comonomers and EPDM rubbers, which EPDM rubbers are prepared by polymerizing ethylene and propylene in the presence of a small amount of a non-conjugated diolefin, in which first (A) the monomers which form the saturated crosslinked elastomeric polymer are copolymerized with copolymerizable monomeric compounds, containing free radical-forming groups, under conditions which preserve the said groups, to give a saturated crosslinked elastomeric polymer containing free radical-forming groups, and thereafter (B) the monomers which form hard polymers are selected from the group consisting of styrene, acrylonitrile and/or methylmethacrylate and are polymerized in the presence of the elastomeric polymer obtained in process stage (A), under conditions under which the free radical-forming groups of the elastomeric polymer decompose, in which process the copolymerizable monomeric compounds containing free radical-forming groups are added, during the preparation of the saturated crosslinked elastomeric polymer, to the polymerization mixture in process stage (A) only when the conversion of the monomers forming the elastomeric polymer is from 50 to 90% by weight, after which polymerization of the mixture is taken to completion.

4,205,145

RESINS FOR PRINTING INKS

Shozo Tsuchiya, Tokyo; Akio Oshima, and Hideo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1978, Ser. No. 887,280

Claims priority, application Japan, Mar. 25, 1977, 52-32045

Int. Cl.[2] C08F 283/00; C08L 61/06, 61/10

U.S. Cl. 525—502 8 Claims

1. A process for the preparation of a resin for printing inks, comprising the steps of:

reacting (A) a conjugated double bond-containing five-membered cyclic compound represented by the following formula

wherein H is hydrogen, R is an organic residue having 1–24 carbon atoms, X is halogen, and l, m and n are each an integer of 0–6 with the total thereof being 6, or a Diels-Alder reaction product thereof, with (B) a phenolic compound in a ratio by weight of from 60:40 to 95:5 in the absence or presence of a catalyst at 150°–330° C. for 10 minutes-20 hours to produce a resin,

addition reacting the thus produced resin with (C) an unsaturated carboxylic acid in an amount by weight of 2–20 parts per 100 parts by weight of the resin at 150°–250° C. for 30 minutes-7 hours to produce an acid-modified resin and then

reacting the thus produced acid-modified resin with (D) a resol-type phenol resin in an amount by weight of 5–40 parts per 100 parts by weight of the acid-modified resin at 160°–300° C. for 30 minutes-15 hours, the resol-type phenol resin (D) being obtained by reacting with formaldehyde in the presence of a basic catalyst phenol or an alkyl-substituted phenol selected from the group consisting of cresol, ethylphenol, isopropylphenol, tert.-butylphenol, tert.-octylphenol and nonylphenol, thereby to prepare the resin for printing inks.

4,205,146

PROCESS FOR THE PREPARATION OF POLYVINYLBUTYRAL HAVING IMPROVED PROPERTIES

Hans D. Hermann, Bad Soden am Taunus; Joachim Ebigt, Frankfurt am Main, and Ulrich M. Hutten, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 18, 1978, Ser. No. 925,873

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732717

Int. Cl.[2] C08F 8/28

U.S. Cl. 525—61 8 Claims

1. Process for the preparation of a polyvinylbutyral having improved properties, which comprises subjecting a polyvinylbutyral having a viscosity of from 10 to 200 cp (measured according to DIN 53 015 at a 5% by weight solution in ethanol at 23° C.) and a content of from 17 to 24% by weight of vinyl alcohol units in an aqueous medium, at a temperature of from 50° to 70° C. in the presence of from 0.01 to 0.5% by weight, calculated on the polyvinylbutyral, of an organic sulfonic acid having from 8 to 30 carbon atoms and being effective as emulsifier to an acetalizing after-treatment for a period of from 0.5 to 10 hours in the presence of from 1 to 100 parts by weight of water per part of polyvinylbutyral and from 0.1 to 5% by weight of inorganic acid, calculated on the aqueous medium, and thereafter recovering the after-treated polyvinylbutyral.

4,205,147

PROCESS FOR RECOVERING MODIFIED POLYVINYL ALCOHOLS FROM AQUEOUS SOLUTION CONTAINING THEM

Hiroshi Kato, Nishinomiya, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1978, Ser. No. 873,064
Claims priority, application Japan, Jan. 31, 1977, 52-10072
Int. Cl.[2] C08F 6/12
U.S. Cl. 525—62 7 Claims

1. A process for recovering a modified polyvinyl alcohol from an aqueous solution thereof consisting essentially of the steps of adding an acid to an aqueous solution of a modified polyvinyl alcohol while maintaining said aqueous solution at a temperature of not less than 40° to cause the modified polyvinyl alcohol to deposit, and recovering the deposited polyvinyl alcohol; said modified polyvinyl alcohol being a polymer obtained by alkali-hydrolysis of a copolymer of vinyl acetate and an unsaturated carboxylic or sulfonic acid, the copolymer containing 0.1 to 2% by mole of units of the unsaturated carboxylic or sulfonic acid and the degree of hydrolysis of the vinyl acetate units being 50 to 80% by mole and said acid being added in a amount of an equivalent or more with respect to the unsaturated carboxylic or sulfonic acid component of said modified polyvinyl alcohol and being at least one member selected from the group consisting of hydrochloric acid, sulfuric acid, nitric acid, phosphoric acid, pyrophosphoric acid, phosphorous acid, acetic acid, oxalic acid and citric acid.

4,205,148

DYEABLE POLYOLEFIN COMPOSITION

Yoshiharu Tatsukami, Niihama; Hazime Nishibara, Shonaimachi; Yasutoshi Kobayashi, Niihama, and Hideo Shinonaga, Nakasonemachi, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 866,402, Dec. 30, 1977, Pat. No. 4,166,079.
This application Apr. 26, 1979, Ser. No. 33,403
Claims priority, application Japan, Jan. 4, 1977, 52-281; Jan. 4, 1977, 52-282; Dec. 1, 1977, 52-144795
Int. Cl.[2] C08D 8/32
U.S. Cl. 525—379 8 Claims

1. A method for producing aminated ethylene-glycidyl acrylates copolymers by amination of ethylene-glycidylacrylates copolymers, which comprises conducting the amination in a heterogeneous system comprising the ethyleneglycidyl acrylates copolymers and a mixed solvent of a secondary amine amine and a lower alcohol, to the extent that not less than 90% of epoxy groups present in the copolymer are aminated, the volume ratio of the amine to the alcohol in the mixed solvent being 20/80 to 85/15, and the amount of the mixed solvent being 1 to 100 parts by weight of the copolymer.

4,205,149

METHOD OF REMOVING VINYL CHLORIDE MONOMER FROM POLYVINYL CHLORIDE RESINS

Frank A. Cich, Norton; Emmett J. Glazer, Stow, and Edwin S. Smith, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 23, 1974, Ser. No. 535,775
Int. Cl.[2] C08F 2/60, 2/16, 6/10, 16/6
U.S. Cl. 526—89 4 Claims

1. The method which comprises polymerizing monomeric vinyl chloride in an emulsion or suspension polymerization system to form vinyl chloride polymer in the presence of propane and reducing the pressure in the system to remove substantially all of the unreacted vinyl chloride and propane from the system.

4. The method which comprises polymerizing vinyl chloride in a bulk polymerization system to form polymeric vinyl chloride, adding butane to the system and then reducing the pressure in the system to remove substantially all of the unreacted vinyl chloride monomer and butane from the system and recovering the polymeric vinyl chloride formed substantially free of monomeric vinyl chloride.

4,205,150

THERMO-REVERSIBLE ELASTOMER COMPOSITION COMPRISING A LIQUID CHLOROPRENE POLYMER AND A POLYVALENT METAL OXIDE OR HYDROXIDE

Kiyonobu Marubashi, Ohmi, Japan, assignor to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 894,952
Int. Cl.[2] C08F 36/16, 236/16; C08G 79/10
U.S. Cl. 526—252 16 Claims

1. A thermo-reversible elastomer composition comprising 100 parts by weight of a liquid chloroprene polymer having a Brookfield viscosity (measured at 25° C.) ranging from about 3,000 to about 3,000,000 cps containing at least one carboxyl group in the molecule and having a number average molecular weight of from about 500 to about 20,000 and at least 1 part by weight of a metal compound which is a polyvalent metal oxide or hydroxide or a metal salt complex comprising a polyvalent metal oxide or hydroxide, said liquid chloroprene polymer having been prepared by (1) homopolymerizing a chloroprene monomer or (2) copolymerizing a chloroprene monomer with a monomer copolymerizable with the chloroprene monomer, in the presence of an organic solvent having a boiling point of less than about 150° C. at atmospheric pressure which is miscible with a mercapto-carboxylic acid and is selected from the group consisting of aromatic hydrocarbons, aliphatic halogenated hydrocarbons, cyclic ethers, aliphatic alcohols, aliphatic ketones and aliphatic esters and 0.5 to 20 parts by weight of a mercaptocarboxylic acid per 100 parts by weight of the monomers.

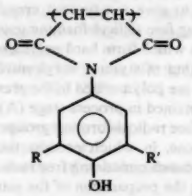
4,205,151

POLYMERIC N-SUBSTITUTED MALEIMIDE ANTIOXIDANTS

James A. Dale, Menlo Park, and Steve Y. W. Ng, San Francisco, both of Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 642,038, Dec. 18, 1975, Pat. No. 4,078,091, which is a division of Ser. No. 565,168, Apr. 4, 1975, abandoned.
This application Aug. 2, 1977, Ser. No. 821,163
Int. Cl.[2] C08F 122/40, 222/40, 4/04
U.S. Cl. 526—262 9 Claims

1. A polymeric maleimide comprising n



units, wherein R and R' independently are lower saturated alkyls of from 1 to 5 carbon atoms and n is an integer from 20 to about 1500.

4,205,152

THERMOSETTING RESIN AND ITS PRODUCTION

Ryuzo Mizuguchi, Tondabayashi; Atsushi Takahashi, Kyoto; Shin-ichi Ishikura, Takatsuki, and Akimitsu Uenaka, Suita, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

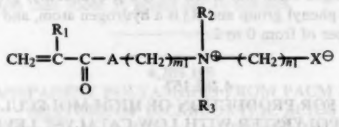
Filed Dec. 9, 1977, Ser. No. 859,102

Claims priority, application Japan, Dec. 9, 1976, 51-148373; Dec. 9, 1976, 51-148374; Dec. 9, 1976, 51-148375

Int. Cl.[2] C08F 20/06, 220/06, 28/00; C08J 3/74

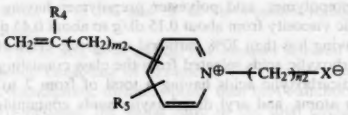
U.S. Cl. 526—265 16 Claims

1. A thermosetting resin which is a linear copolymer having a number average molecular weight of 1,000 to 50,000 and a glass transition point of −20° to +80° C., obtained by polymerizing in a hydrophilic organic solvent (1) 0.5 to 30% by weight of at least one polymerizable monomer having an ampho-ionic structure, selected from the group consisting of (i) compounds representable by the formula



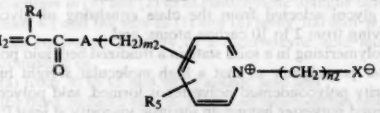
[I]

wherein R_1 is a hydrogen atom or a methyl group, R_2 and R_3 are each, the same or different, a C_1–C_6 alkyl group, A is O or NH, m_1 and n_1 are each, the same or different, an integer of 1 to 12 and $X^{\ominus}$ is $SO_3^{\ominus}$, $SO_4^{\ominus}$ or $CO_2^{\ominus}$ and (ii) compounds representable by either one of the formulae:



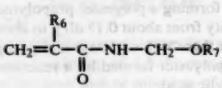
[II]

and



[III]

wherein R_4 is a hydrogen atom or a methyl group, R_5 is a hydrogen atom or a C_1–C_3 alkyl group, m_2 is an integer of 0 to 6 and n_2 is an integer of 1 to 6, and A and $X^{\ominus}$ are as defined above, (2) 1 to 60% by weight of at least one polymerizable monomer containing a reactive amide group, representable by the formula:



[IV]

wherein R_6 is a hydrogen atom or a methyl group and R_7 is a hydrogen atom or a C_1–C_4 alkyl group and (3) 2 to 40% by weight of at least one polymerizable monomer containing a carboxyl group and (4) 5 to 95% by weight of at least one of other polymerizable monomers containing an ethylenic double bond.

4,205,153

DIENE INTERPOLYMERS WITH HALOGENATED MONOMERS

Arthur H. Weinstein, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 811,495, Jun. 30, 1977, abandoned, which is a division of Ser. No. 642,816, Dec. 22, 1975, abandoned. This application Aug. 21, 1978, Ser. No. 935,407

Int. Cl.[2] C08F 236/16, 2/26

U.S. Cl. 526—292 5 Claims

1. An elastomeric interpolymer prepared by the method which comprises aqueous emulsion polymerizing, at a temperature in the range of about 40° C. to 60° C., in the presence of a free radical generating catalyst selected from at least one of bis-azo isobutyronitrile, postassium persulfate, ammonium persulfate, benzoyl peroxide, p-methane hydroperoxide and cumene hydroperoxide and in the presence of an alkali metal salt of an organic sulfonic acid emulsifier, a monomer mixture comprised of (A) about 45 to about 70 weight percent dienes selected from at least one of 1,3-butadiene and isoprene, (B) about 15 to about 40 weight percent of at least one comonomer selected from pentachlorophenyl methacrylate, 2,4,6-tribromophenyl methacrylate, 2,3,4,6-tetrachorophenyl acrylate, 2,4,6-trichlorophenyl acrylate, pentabromophenyl acrylate, 2,4,6-tribromophenyl acrylate, 2,4-dimbromophenyl acrylate, pentachlorophenyl methacrylate, 2,3,4,6-tetrachlorophenyl methacrylate, 2,4,6-trichlorophenyl methacrylate, pentabromophenyl methacrylate, 2,4-dibromophenyl methacrylate, pentachlorothiophenyl acrylate, pentachlorothiophenyl methacrylate, N-2,4,6-tribromophenyl acrylamide and N-2,4,6-tribromophenyl methacrylamide, and (C) about 5 to about 20 weight percent of a termonomer selected from at least one of (1) styrene, α-methyl styrene, acrylonitrile and α-methacrylonitrile, or (2) alkyl esters selected from at least one of ethyl acrylate, butyl acrylate, 2-ethyl hexyl acrylate and methyl methacrylate; where said elastomeric interpolymer has a glass transition temperature in the range of about −40° C. to about −66° C.

4,205,154

TRIALLYL CARBONATE POLYMERS

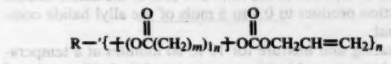
Henry C. Stevens, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 839,684, Oct. 5, 1977, Pat. No. 4,144,262. This application Nov. 1, 1978, Ser. No. 956,544

Int. Cl.[2] C08F 18/24

U.S. Cl. 526—314 2 Claims

1. A solid polymerizate of an allyl carbonate monomer having the formula:

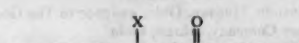


where the l_n's are integers from 0 to 5, the sum of the l_n's is at least 2, m is 4 or 5, n is greater than 2 and R is chosen from the group consisting of

and

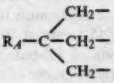
where R_A is chosen from the group consisting of —H, —CH_3, —CH_2CH_3, —$CH_2CH_2CH_3$, and —$CH_2CH_2CH_2CH_3$.

2. A solid polymerizate of an allyl carbonate monomer having the formula:



where the l_n's are integers from 0 to 5, the sum of the l_n's is at least 2, X is —H or —CH_3, n is greater than 2 and R is chosen from the group consisting of

and



where R_4 is chosen from the group consisting of —H, —CH_3, —CH_2CH_3, —$CH_2CH_2CH_3$, and —CH_2—CH_2—CH_2—CH_3.

4,205,155

PROCESS FOR THE PRODUCTION OF POLY(ALLYL HALIDE AMINE SILICATE) REACTION PRODUCTS

David H. Blount, 545 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 862,020, Dec. 19, 1977, Pat. No. 4,157,438, which is a continuation-in-part of Ser. No. 757,239, Jan. 6, 1977, Pat. No. 4,069,391, which is a division of Ser. No. 622,525, Oct. 15, 1975, Pat. No. 4,020,259. This application Aug. 25, 1978, Ser. No. 936,751

Int. Cl.[2] **C08F** *283/12;* **C08G** *63/76;* **C08L** *67/00;* **C08F** *30/08*

U.S. Cl. 528—28 **9 Claims**

1. The process for the production of allyl halide amine silicate reaction products by the following steps:

(a) mixing an organic polyamine with an oxidized silicon compound, selected from the group consisting of hydrated silica, silica, silicoformic acid and mixtures thereof, in the ratio of about 1 or 2 mols of the polyamine to 1 mol of the oxidized silicon compound;

(b) mixing in an alkali catalyst in the amount of 1% to 10% by weight, percentage based on the weight of the oxidated silicon compound;

(c) heating the mixture to just below the boiling temperature of the polyamine while agitating at ambient pressure for 20 to 90 minutes, thereby

(d) producing an amine silicate reaction product;

(e) adding said amine silicate reaction product to an allyl halide compound in the ratio of 1 mol of the amine silicate reaction product to 0.5 to 6 mols of the allyl halide compound;

(f) agitating said mixture for 10 to 60 minutes at a temperature between ambient temperature and the boiling point of the reactants, thereby producing a poly(allyl halide amine silicate) resinous product.

4,205,156

NOVEL IMIDAZOLE-ISOCYANURIC ACID ADDUCTS AND UTILIZATION THEREOF

Natsuo Sawa; Tadao Nomoto, both of Nakatado; Keiko Iuchi, Tokushima; Toshihiro Suzuki, Marugame, and Shunichi Kawata, Mitoyo, all of Japan, assignors to Shikoku Chemicals Corporation, Kagawa, Japan

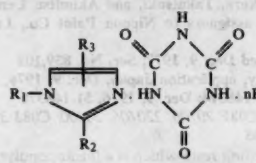
Division of Ser. No. 885,948, Mar. 13, 1978. This application Jan. 22, 1979, Ser. No. 5,493

Claims priority, application Japan, Mar. 18, 1977, 52-30886

Int. Cl.[2] **C08G** *59/56*

U.S. Cl. 528—117 **8 Claims**

1. An epoxy resin composition comprising (a) 100 parts by weight of an epoxy resin having more than 1 epoxy group in one molecule and (b) 1 to 10 parts by weight of a compound represented by the following general formula:



wherein R_1 is a member selected from the group consisting of a hydrogen atom, a β-cyanoethyl group, a benzyl group and a β-[3,5-diamino-S-triazinyl-(1)]-ethyl group, R_2 stands for a monovalent hydrocarbon group having up to 17 carbon atoms, R_3 is a member selected from the group consisting of a hydrogen atom and an alkyl group having up to 4 carbon atoms, with the proviso that when R_1 is a hydrogen atom, R_2 is a methyl or phenyl group and R_3 is a hydrogen atom and when R_1 is a β-cyanoethyl group, R_2 is a phenyl group and R_3 is a hydrogen atom, and n is a number of from 0 to 2.

4,205,157

METHOD FOR PRODUCTION OF HIGH MOLECULAR WEIGHT POLYESTER WITH LOW CATALYST LEVEL AND LOW CARBOXYL CONTENT

Ben Duh, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 2, 1979, Ser. No. 25,697

Int. Cl.[2] **C08G** *63/18, 63/36*

U.S. Cl. 528—272 **44 Claims**

1. A method for the production of a high molecular weight, high purity polyester comprising the steps of

(a) reacting a glycol and a dicarboxylic acid to form a polyester prepolymer, said polyester prepolymer having an intrinsic viscosity from about 0.15 dl/g to about 0.45 dl/g and having less than 20% carboxyl end group content,

said dicarboxylic acids selected from the class consisting of alkyl dicarboxylic acids having a total of from 2 to 16 carbon atoms, and aryl dicarboxylic acids containing a total of from 8 to about 16 carbon atoms,

said glycol selected from the class consisting of glycols having from 2 to 10 carbon atoms; and

(b) polymerizing in a solid state in a fluidized bed, said polyester prepolymer so that a high molecular weight high purity polycondensed polyester is formed, said polycondensed polyester having an intrinsic viscosity at least 0.60 dl/g and having less than 20% carboxyl end group content.

21. A high molecular weight, high purity polyester, comprising:

a polycondensed polyester produced by a two-step polymerization, said polycondensed polyester having an intrinsic viscosity at least 0.60 dl/g and having less than 20% carboxyl end group content;

said two-step polymerization comprising a melt process and a solid-state polymerization in a fluidized bed;

said melt process forming a polyester prepolymer having an intrinsic viscosity from about 0.15 dl/g to about 0.45 dl/g, and having less than 20% carboxyl end group content;

said prepolymer polyester formed by a reaction of a glycol and a dicarboxylic acid;

said dicarboxylic acid selected from the class consisting of alkyl dicarboxylic acids having a total of from 2 to 16 carbon atoms, and aryl dicarboxylic acids containing a total of from about 8 to about 16 carbon atoms;

said glycol having from 2 to 10 carbon atoms; and

said solid state polymerization forming said polycondensed polyester from said polyester prepolymer.

4,205,158

COPOLYETHERESTER BASED ON ETHYLENE OXIDE-CAPPED POLY(PROPYLENE OXIDE) GLYCOL AND BRANCHING AGENT

Guenther K. Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1979, Ser. No. 24,859

Int. Cl.[2] C08G *63/18*

U.S. Cl. 528—300 8 Claims

1. A copolyetherester composition derived from terephthalic acid or its ester-forming equivalent, 1,4-butanediol, an ethylene oxide-capped poly(propylene oxide) glycol and a branching agent having a functionality of 3–6, said ethylene oxide-capped poly(propylene oxide) glycol having an ethylene oxide content of from about 15–35 weight percent and a number average molecular weight ranging from about 1500–2800, and said branching agent being present in a concentration of from about 1.5–6.0 equivalents per 100 moles of terephthalic acid or ester-forming equivalent thereof; and said copolyetherester composition containing from about 25–48 weight percent, 1,4-butylene terephthalate units and having a melt index at 230° C. of less than about 50 grams per 10 minutes.

4,205,159

TRANSPARENT POLYAMIDES FROM PACM AND A MIXTURE OF DICARBOXYLIC ACIDS

Rolf-Volker Meyer; Rolf Dhein, and Friedrich Fahnler, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 17, 1978, Ser. No. 925,409

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732928

Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—338 4 Claims

1. A transparent thermoplastic polyamide which is the polycondensation product of

(1) from 70 to 100 mol % of bis-(4-aminocyclohexyl)methane;

(2) 0 to 30 mol % of at least one member selected from the group consisting of hexamethylene diamine and C_8–C_{15} cycloaliphatic diamines other than bis-(4-aminocyclohexyl)-methane, the molar ratio of the total cycloaliphatic diamines in (1) and (2) to hexamethylene diamine being at least 4:1 and the sum of (1) and (2) being 100 mol %, and

(3) an equivalent quantity of a dicarboxylic acid mixture consisting of

(a) from 70 to 85 mol % of azelaic acid and

(b) from 30 to 15 mol % of at least one member selected from the group consisting of isophthalic acid and adipic acid, the sum of (a) and (b) being 100 mol %.

4,205,160

INDANE CONTAINING POLYMERS

Richard E. Gloth, Copley, and James J. Tazuma, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1976, Ser. No. 665,838

Int. Cl.[2] C08G *83/00*

U.S. Cl. 528—425 5 Claims

1. The method which comprises treating a material selected from the group consisting of 1,3-diisopropyl benzene diol, 1,4-diisopropyl benzene diol or mixtures of 1,3- and 1,4-diisopropyl benzene diols with an acidic clay, silica alumina, Bronsted acid or Lewis acid catalyst in the presence of a water azeotroping agent at temperature at which the azeotroping agent refluxes and removes water from the system for a time sufficient to form a resin having an average softening point of 120° C. to 200° C. and an indane unit content of about 20 to 100 mol percent.

4,205,161

PROCESS FOR REDUCING CONTENT OF FREE VINYL CHLORIDE BY POSTTREATING COPOLYMER WITH REDOX CATALYST

Hubert Wiest; Peter Ludwig; Klaus Häfener, and Erwin Lieb, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,206

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701147

Int. Cl.[2] C08F *6/24, 6/16*

U.S. Cl. 528—487 6 Claims

1. A process for the production of vinyl chloride copolymer dispersions having a reduced content of free vinyl chloride comprising the steps of polymerizing a monomer mixture containing from 15% to 90% by weight of vinyl chloride and the remainder, mono-olefinically unsaturated monomers copolymerizable with vinyl chloride selected from the group consisting of vinyl alkanoates having from 1 to 18 carbon atoms in the alkanoate, esters of alkanols having from 1 to 8 carbon atoms with acrylic acid and methacrylic acid, diesters of alkanols having from 1 to 8 carbon atoms with maleic acid, fumaric acid and itaconic acid, ethylene, propylene and mixtures thereof, with from 0 to 5% of the monomer mixture, mono-olefinically-unsaturated monomers copolymerizable with vinyl chloride and having functional groups and from 0 to 2% of the monomer mixture, poly-olefinically-unsaturated monomers copolymerizable with vinyl chloride, under aqueous emulsion polymerization conditions at temperatures of 30° C., to 80° C., in the presence of from 0 to 10% by weight of emulsifiers and from 0 to 5% by weight of protective colloids, with a minimum of 0.1% of at least one of said emulsifiers and said protective colloids, as well as from 0.05% to 2% by weight of free-radical-former polymerization catalysts, all based on the polymerization product, post-polymerizing until a decrease in the autogeneous pressure occurs, releasing the pressure, flushing the gas space above the copolymer dispersion free of monomer, cooling the copolymer dispersion by at least 10° C. to 40° C., to a temperature of from 10° C. to 40° C., said cooled copolymer dispersion having a vinyl chloride content of over 50 ppm, adding a redox catalyst to the cooled dispersion consisting of from 0.002% to 0.5% by weight of the dispersion, of an oil-soluble peroxy compound, and a water-soluble sulfur-containing reducing agent in a ratio of reducing agent to peroxy compound of 0.5 to 3 equivalents, allowing the dispersion to stand at a temperature of from 10° C. to 40° C. for a period of two hours to two days and recovering a copolymer dispersion having a vinyl chloride content of less than 50 ppm.

4,205,162

POLYMER RECOVERY PROCESS

Eva J. Herscovici, Chappaqua, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 3, 1978, Ser. No. 957,596

Int. Cl.[2] C08J *3/00*

U.S. Cl. 528—499 10 Claims

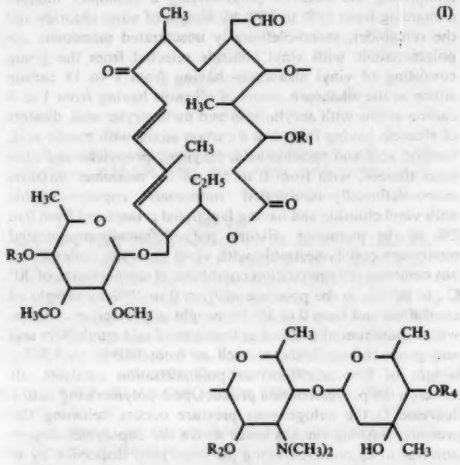
1. A process for the removal, in finely divided form, of a polymer product from a solution consisting essentially of an inert organic solvent having a boiling point temperature below the boiling point temperature of water and polymer product, said process comprising adding said solution to a non-boiling, hot water solution under conditions of sufficient, non-shearing agitation and turbulence to effect removal of the solvent from the solution, by boiling off of the solvent, with production of a slurry of water and finely divided polymer product.

4,205,163
TYLOSIN DERIVATIVES

Shunro Mori; Rokuro Okamoto, both of Fujisawa; Taiji Inui, Chigasaki, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1978, Ser. No. 954,055
Claims priority, application Japan, Nov. 8, 1977, 52/134428; Nov. 9, 1977, 52/134961
Int. Cl.[2] A61K *31/71*; C07H *17/08*
U.S. Cl. 536—17 R 50 Claims

1. An acyl derivative of tylosin of the following formula I:



(I)

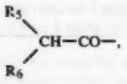
wherein

R_1 represents hydrogen or acetyl,

R_2 represents hydrogen, acetyl, propionyl or chlorinated acetyl,

R_3 represents hydrogen, chlorinated acetyl, carboethoxy or phenoxyacetyl, and

R_4 represents hydrogen or



wherein

R_5 represents hydrogen, methyl, ethyl, hydroxyl or acetoxy, and R_6 represents an alkyl having 3 to 8 carbons (when the number of the carbons is 3, R_5 being a group other than hydrogen), phenyl, 4-nitrophenyl, 4-acetoxyphenyl, naphthyl, benzyl, 4-acetoxybenzyl, cyclohexylmethyl, thienyl, pyridyl, N-acetylanilino, imidazolylmethyl, phenylthio, 4-methylphenylthio, 3-methylphenylthio, 4-chlorophenylthio, benzylthio, phenylthiomethyl, cyclohexylthio, pyridylthio, benzenesulfonyl, phenoxy, naphthoxy or phenoxymethyl,

with the proviso that when R_4 represents hydrogen, R_2 and R_3 each represents a group other than hydrogen, and when R_4 represents a group other than hydrogen, R_2 and R_3 each represents hydrogen and

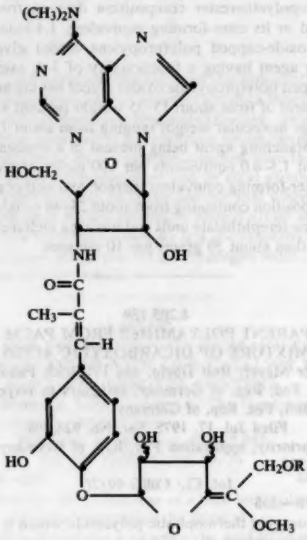
a nontoxic acid addition salt thereof.

4,205,164
ANTIBIOTIC A201C, A201D AND A201E

Herbert A. Kirst, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 2, 1979, Ser. No. 17,018
Int. Cl.[2] C07D *405/14*
U.S. Cl. 542—421 3 Claims

1. The compound of the formula



wherein R is

α-3,4-di-O-methylrhamnosyl.

4,205,165
PROCESSING OF CEPHALOSPORIN C

Harry C. Stables, and Kenneth Briggs, both of Ulverston, England, assignors to Glaxo Group Limited, London, England

Filed Dec. 1, 1978, Ser. No. 965,586
Claims priority, application United Kingdom, Dec. 6, 1977, 50772/77
Int. Cl.[2] C07D *501/12*
U.S. Cl. 544—20 6 Claims

1. A process for the recovery of cephalosporin C which comprises

(a) contacting a fermentation broth containing cephalosporin C with an anion exchange resin which is either a weak-base resin in the weak acid salt form or free base form or a strong-base resin in the weak acid salt form, to obtain a weakly acidic percolate containing said cephalosporin C from which anions of strong acids present in said broth have been removed;

(b) contacting said percolate with a strong cation exchange resin in the acid form, whereby cations in said resulting solution are replaced by protons and said cephalosporin C remains in the substantially deionised percolate; and

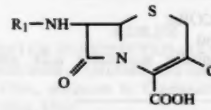
(c) adsorbing cephalosporin C from said percolate onto a weak-base anion exchange resin.

4,205,166
7-SUBSTITUTED-3-AMINOALKYL-, ACYLAMINOALKYL-, OR HYDROXYALKYL-SUBSTITUTED HETEROCYCLIC THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES AND PREPARATION THEREOF

Takashi Kamiya, Suita; Kunihiko Tanaka; Tsutomu Teraji, both of Toyonaka, and Keiji Hemmi, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 454,805, Mar. 26, 1974, abandoned, Ser. No. 509,905, Sep. 27, 1974, Pat. No. 4,077,965, and Ser. No. 519,030, Oct. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 509,905, , and Ser. No. 454,805, , said Ser. No. 509,905, is a continuation-in-part of Ser. No. 454,805,. This application Feb. 18, 1975, Ser. No. 550,341
Claims priority, application Japan, Feb. 20, 1974, 49-20915
Int. Cl.[2] C07D *501/56, 501/54, 257/04, 285/12*
U.S. Cl. 544—27 38 Claims

1. A compound of the formula:



wherein

R_1 is (a) lower alkyl-substituted or unsubstituted thienyl(-lower)alkanoyl, tetrazolyl(lower)alkanoyl, oxadiazolyl(-lower)alkanoyl, (b) lower alkylthio(lower)alkanoyl, in which the alkanoyl moiety may be substituted with hydroxy, amino or lower alkoxycarbonylamino, or (c) phenyl(lower)alkanoyl, in which the alkanoyl moiety may be substituted with hydroxy, and

R_2 is amino(lower)alkyl-, lower alkanoylamino(lower)alkyl-, lower alkanesulfonylamino(lower)alkyl-, lower alkoxycarbonylamino(lower)alkanoylamino(lower)alkyl-, guanidinocarbonylamino(lower)alkyl-, lower alkylcarbamoylamino(lower)alkyl-, sulfo(lower) alkylamino(lower)alkyl- or hydroxy(lower)alkyl-substituted thiadiazolyl or amino(lower)alkyl-, lower alkoxycarbonylamino(-lower) alkyl- or sulfo(lower)alkylamino(lower)alkyl-substituted tetrazolyl,

and nontoxic pharmaceutically acceptable salts thereof.

4,205,167
PROCESS FOR PRODUCING CYAMELURIC CHLORIDE

Claude Gremmelmaier, Aesch, and Jean Riethmann, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 2, 1979, Ser. No. 26,262
Int. Cl.[2] C07D *403/14*
U.S. Cl. 544—209 6 Claims

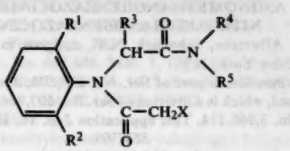
1. A process for producing cyameluric chloride, which process comprises passing cyanuric chloride, mixtures of cyanuric chloride and cyanogen chloride, or cyanogen chloride, at temperatures of 200° to 700° C., together with oxygen over active charcoal, and separating the resulting cyameluric chloride by desublimation from the gas mixture obtained.

4,205,168
N-CARBAMYLALKYL-2,6-DIALKYL-α-HALOACETANILIDES

David C. K. Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 24, 1973, Ser. No. 400,287
Int. Cl.[2] C07D *295/00;* C07C *103/24*
U.S. Cl. 544—165 19 Claims

1. A compound of the formula



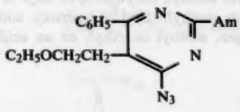
wherein R^1 and R^2 individually are alkyl of 1 to 6 carbon atoms; R^3 is hydrogen; R^4 and R^5 individually are hydrogen, alkyl of 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms; and X is chlorine or bromine, with the proviso that R^4 and R^5 may together form a divalent alkylene group of 4 to 6 carbon atoms or $—CH_2CH_2OCH_2CH_2—$.

4,205,169
N-[4-AZIDO-5-(2-ETHOXYETHYL)-6-PHENYL-2-PYRIMIDINYL]ACETAMIDE AND CONGENERS

Hans A. Wagner, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Apr. 9, 1979, Ser. No. 28,034
Int. Cl.[2] C07D *239/48, 487/04*
U.S. Cl. 544—323 11 Claims

1. A compound of the formula



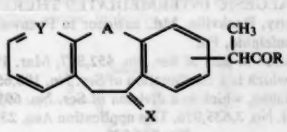
wherein Am represents (1-oxoalkyl)amino, bis(1-oxoalkyl-)amino, [(alkylamino)carbonyl]amino, (alkoxycarbonyl)amino, or bis(alkoxycarbonyl)amino in which each of the constituent oxoalkyls, alkyls, and alkoxys contains fewer than 5 carbons.

4,205,170
PROPIONIC ACID DERIVATIVES

Yasuo Fujimoto, Tokyo, and Shigeru Yamabe, Kobe, both of Japan, assignors to Nippon Chemiphar Company, Limited, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,076
Claims priority, application Japan, Dec. 3, 1976, 51-145403; Dec. 3, 1976, 51-145404; Jun. 17, 1977, 52-71690
Int. Cl.[2] C07D *491/04, 495/04, 313/14, 337/14*
U.S. Cl. 546—80 44 Claims

1. A compound of the formula,



wherein X represents an oxygen or two hydrogen atoms, Y represents CH or N, A represents an oxygen or sulfur atom, and R represents hydroxy, amino or a lower alkoxy group having 1 to 5 carbon atoms.

4,205,171

AMINOMETHANOBENZAZOCINES AND NITROMETHANOBENZAZOCINES

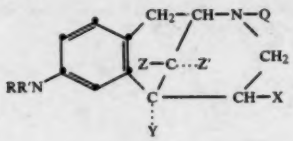
Noel F. Albertson, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 648,509, Jan. 12, 1976, abandoned, which is a division of Ser. No. 507,966, Sep. 20, 1974, Pat. No. 3,968,114. This application Jan. 16, 1978, Ser. No. 869,708

Int. Cl.[2] C07D *221/26*

U.S. Cl. 546—97 **34 Claims**

1. Hexahydro-3-Q-8-RR'N-5-X-6-Y-11-Z-11-Z'-2,6-methano-3-benzazocine having the formula



wherein:

Q is propyl, isobutyl, neopentyl, allyl, 2-methyl-2-propenyl, 2-chloro-2-propenyl, cis-3-chloro-2-propenyl, cis-3-chloro-2-butenyl, trans-3-chloro-2-butenyl, propargyl, cyclopropylmethyl or (2,2-dichlorocyclopropyl)methyl;

R is hydrogen or methyl;

R' is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, sec-butyl, benzyl or cyclopropylmethyl;

X is hydrogen, methyl or ethyl;

Y is hydrogen, methyl, ethyl, propyl, allyl or phenyl;

Z is hydrogen, methyl, ethyl or hydroxy; and

Z' is hydrogen, methyl or ethyl; or an acid addition salt thereof.

4,205,172

7,10-DICHLORO-3-METHYL-4-PHENYL-1,2,3,4-TETRAHYDROBENZ[H]ISOQUINOLINE HYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,610

Int. Cl.[2] C07D *221/10*; A61K *31/47*

U.S. Cl. 546—101 **1 Claim**

1. The compound 7,10-dichloro-3-methyl-4-phenyl-1,2,3,4-tetrahydrobenz[h]isoquinoline hydrobromide.

4,205,173

1-HETEROCYCLIC ALKYL-1,2,3,4-TETRAHYDROQUINAZOLINONES AND ANALGESIC INTERMEDIATES THEREOF

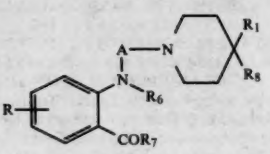
Bola V. Shetty, Rockville, Md., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 452,587, Mar. 19, 1974, abandoned, which is a continuation of Ser. No. 108,659, Jan. 21, 1971, abandoned, which is a division of Ser. No. 691,955, Dec. 20, 1967, Pat. No. 3,635,976. This application Aug. 23, 1976, Ser. No. 716,930

Int. Cl.[2] C07D *211/52*

U.S. Cl. 546—218 **4 Claims**

1. A member of the group consisting of (a) a compound having the formula:



wherein:

R is H, lower alkyl, hydroxy, lower alkoxy, halogen, amino or—NHCHO;

A is $(CH_2)_n$, where n is 1–5, or branched chain alkyl of 3–5 carbons;

R_1 is phenyl;

R_6 is H, lower alkyl, lower alkanoyl, benzoyl, benzyl or benzyl substituted in the ring with NH_2, OH, OCH_3 or Cl;

R_7 is $—NH_2$, —NH-lower alkyl or —N=(disubstituted with lower alkyl);

R_8 is —OH or $—OCOR_9$;

R_9 is lower alkyl; and

(b) a pharmacologically acceptable acid addition salt thereof.

4,205,174

PROCESS FOR THE PRODUCTION OF 6-SUBSTITUTED 4-METHYL-2-PYRIDONES

Urs Michel, Visp, Switzerland, assignor to Lonza Ltd., Basel, Switzerland

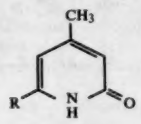
Filed Jan. 11, 1979, Ser. No. 2,594

Claims priority, application Switzerland, Jan. 11, 1978, 272/78

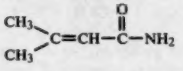
Int. Cl.[2] C07D *213/64*

U.S. Cl. 546—249 **17 Claims**

1. Process for the production of a 6-substituted-4-methyl-2-pyridone having the formula:



wherein R is a branched alkyl group, an unbranched alkyl group a halogenated branched alkyl group, an halogenated unbranched alkyl group, a substituted aryl group or an unsubstituted aryl group, characterized in that: (a) senecioic acid amide having the formula:



is reacted in a solvent at an elevated temperature in the presence of a Lewis acid, as the catalyst, with an acyl chloride having the formula:

wherein R has the same meaning as above, (b) the resultant reaction mixture is inserted into an aqueous phase, whereby hydrolysis occurs, and (c) the 6-substituted-4-methyl-2-pyridione is separated by extraction through the buffering of the reaction mixture at a pH of 4 to 5.

4,205,175

CHLORINATION PROCESS

Roy D. Bowden, and Thomas Seaton, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 7, 1979, Ser. No. 10,598

Claims priority, application United Kingdom, Feb. 15, 1978, 5982/78

Int. Cl.[2] C07D *213/26*

U.S. Cl. 546—345 4 Claims

1. A process for the preparation of a mixture of a partially chlorinated derivative of 3-methyl-pyridine selected from the group consisting of, 2-chloro-5-(trichloromethyl)-pyridine, 2-chloro-3-(trichloromethyl)-pyridine, 2-chloro-3-(dichloromethyl)-pyridine and 2-chloro-5-(dichloromethyl)-pyridine, which process comprises chlorinating 3-methyl-pyridine in the vapour phase at a temperature in the range from 250° C. to 400° C., the proportion of chlorine employed being at least 5 moles per mole of 3-methyl-pyridine.

4,205,176

ESTER SUBSTITUTED OXAZOLINES

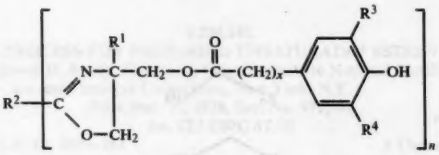
Mary J. Zestermann, Cincinnati, and John F. Hussar, Loveland, both of Ohio, assignors to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Filed Oct. 18, 1978, Ser. No. 952,492

Int. Cl.[2] C07D *263/14*

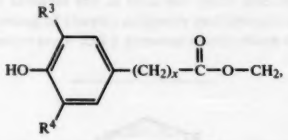
U.S. Cl. 548—239 9 Claims

1. An oxazoline compounds having the following formula



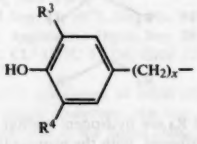
wherein

R^1 is



CH_3 or $CH_3—CH_2$,

R^2 is, when n is 1,



or an alkyl group having from 1 to 23 carbon atoms,

R^2 is when n is 2, an alkylene group having from 1 to 8 carbon atoms,

R^3 and R^4 are the same or different monovalent straight or branched chain alkyl groups having from 1 to 8 carbon atoms,

n is 1 or 2 and

x is an integer of from 1 to 4.

4,205,177

CARBAMYLTRIAZOLE INSECTICIDES

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 662,496, Mar. 1, 1976, Pat. No. 4,160,839. This application Oct. 5, 1977, Ser. No. 839,695

Int. Cl.[2] C07D *249/12*

U.S. Cl. 548—265 6 Claims

1. 1-(N,N-Dimethylcarbamyl)-3-cyclopropyl-5-(2-propynylthio)-1H-1,2,4-triazole.

2. 1-(N,N-Dimethylcarbamyl)-3-propyl-5-(2-propynylthio)-1H-1,2,4-triazole.

3. 1-(N,N-Dimethylcarbamyl)-3-cyclopropyl-5-(2-bromoallylthio)-1H-1,2,4-triazole.

4. 1-(N,N-Dimethylcarbamyl)-3-tert.-butyl-5-allylthio-1H-1,2,4-triazole.

5. 1-(N,N-Dimethylcarbamyl)-3-isopropyl-5-allylthio-1H-1,2,4-triazole.

4,205,178

6-KETO PROSTAGLANDIN E-TYPE COMPOUNDS

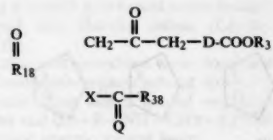
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 755,675, Dec. 30, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 829,679

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—121 44 Claims

1. A compound of the formula



or a mixture comprising that compound and the enantiometer thereof

wherein D is

(1) $—(CH_2)_3—C(R_2)_2—$

(2) $—CH_2—O—CH_2—Y—$ or

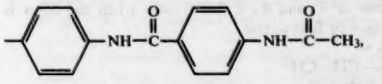
(3) $—CH_2CH=CH—$

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $—CH_2—$ or $—(CH_2)_2—$,

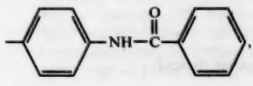
wherein Q is

wherein R_8 is hydrogen, methyl, or ethyl, wherein R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

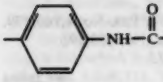
(g)

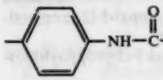


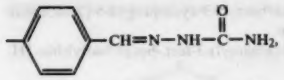
(h)

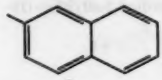


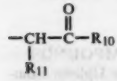
-continued

(i) 

(j) 

(k) 

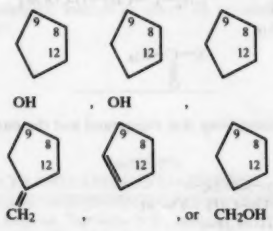
(l) 

(m) 

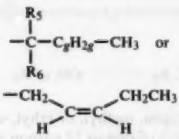
wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, or

(n) a pharmacologically acceptable cation,

wherein R_{18} is



wherein R_{38} is



(1)

or

(2)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro, and

wherein X is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C—

(4) $-CH_2CH_2-$,

including the lower alkanoates thereof.

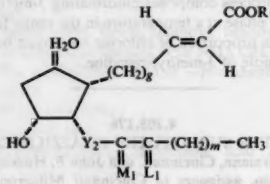
4,205,179

TRANS-2,3,13,14-TETRADEHYDRO-9-DEOXY-9-METHYLENE-PGF COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 893,771, Apr. 5, 1978, Pat. No. 4,165,436.
This application Aug. 11, 1978, Ser. No. 932,998
Int. Cl.[2] C07C 177/00
U.S. Cl. 560—121 14 Claims

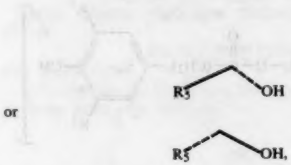
1. A prostaglandin analog of the formula



wherein m is one to 5, inclusive;

wherein Y_2 is —C≡C—;

wherein M_1 is



wherein R_5 is hydrogen or methyl;

wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein g is 4, 5, or 6;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

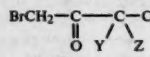
4,205,180

α-ALKOXYIMINO-β-OXO-γ-BROMOBUTYRIC ACID

Michihiko Ochiai, Osaka; Taiiti Okada, Kyoto; Osami Aki, Kawanishi; Akira Morimoto; Kenji Kawakita, both of Osaka, and Yoshihiro Matsushita, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 642,356, Dec. 19, 1975, Pat. No. 4,098,888.
This application Jan. 18, 1978, Ser. No. 870,932
Claims priority, application Japan, Dec. 19, 1974, 48/46567; United Kingdom, Jun. 9, 1975, 24611/75
Int. Cl.[2] C07C *119/12*
U.S. Cl. 560—168 8 Claims

1. A member selected from the group of (a) a compound of the formula:



wherein Y and Z together represent a group of the formula:

wherein R_5 is lower alkoxy, (b) an alkali metal salt thereof and (c) an ester thereof selected from the group of C_1 to C_4 alkyl esters, β-methylsulfonylethyl ester, trichloroethyl ester, diphenylmethyl ester, phenyl ester, tolyl ester, p-tert-butylphenyl ester, p-nitrophenyl ester, benzyl ester, phenethyl ester, tolubenzyl ester, p-methoxybenzyl ester and p-nitrobenzyl ester.

4,205,181

PROCESS FOR PREPARING UNSATURATED ESTERS

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,856
Int. Cl.[2] C07C *67/05*
U.S. Cl. 560—241 8 Claims

1. A process for the preparation of unsaturated esters which comprises contacting a C_3 to C_8 olefin, oxygen and a C_2 to C_8 carboxylic acid in the vapor phase in the presence of a catalytically effective amount of the catalyst consisting essentially of an oxide of uranium and at least one oxide selected from the group consisting of arsenic, antimony and bismuth oxides at an elevated temperature and a pressure above about 40 psig.

4,205,182

PROCESS FOR PREPARING ETHYL ESTERS OF ALIPHATIC CARBOXYLIC ACIDS

Yusuke Izumi, Shinnanyo; Junji Maekawa, Kudamatsu, and Katsumi Suzuki, Tokuyama, all of Japan, assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,666
Claims priority, application Japan, Sep. 28, 1977, 52/115540
Int. Cl.[2] C07C *67/04*; B01J *21/02*
U.S. Cl. 560—247 27 Claims

1. In a process for producing an ethyl ester of an aliphatic carboxylic acid which comprises reacting ethylene with an aliphatic carboxylic acid in the liquid phase in the presence of an acid catalyst, the improvement wherein the acid catalyst used is a heteropolyacid of tungsten or its acid metal salt selected from the group consisting of acidic alkali metal salts and acidic copper salt, said heteropolyacid having a central atom of silicon, phosphorus, boron, arsenic, germanium, titanium, cobalt, iron, aluminum, chromium, zirconium, gallium or tellurium and the reaction is carried out in the presence of water in an amount ranging from about 0.01 to about 7.5% by weight based on the weight of said aliphatic carboxylic acid.

4,205,183

FACILE METHOD FOR ISOLATING RESOLVED AMINO ACIDS

Anita L. Hong, San Jose, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 8, 1978, Ser. No. 967,747
Int. Cl.[2] C07B *19/02*
U.S. Cl. 562—401 4 Claims

3. A method for isolating L and D amino acids from an aqueous solution of resolved amino acids comprising (L)—H_2N—CHX—COOH and (D)—H_2N—CHX—COOY, wherein X is an amino acid side chain and derivatives thereof and wherein Y is a suitable alkyl group, comprising:

(a) protecting the N-terminus of (L)—H_2N—CHX—COOH and (D)—H_2N—CHX—COOY present in said aqueous solution of resolved amino acids with an N-protecting group to thereby obtain an aqueous solution comprising (L)—R—NH—CHX—COOH and (D)—R—NH—CHX—COOY, wherein R represents said N-protecting group;

(b) contacting said aqueous solution with a base capable of reacting with (L)—R—NH—CHX—COOH to form the N-protected L-amino acid salt thereof in said aqueous solution;

(c) contacting said aqueous solution with a suitable water immiscible organic solvent thereby forming a water layer and an organic solvent layer whereby said N-protected L-amino acid salt is isolated in said water layer and said (D)—R—NH—CHX—COOY is isolated in said organic solvent layer;

(d) separating said layers to thereby obtain a water fraction comprising said L-amino acid salt and an organic fraction comprising said (D)—R—NH—CHX—COOY;

(e) adding a suitable acid to said water fraction to neutralize said base and thereby obtain (L)—R—NH—CHX—COOH;

(f) contacting said neutralized water fraction with a suitable water immiscible organic solvent thereby forming a second water layer and a second organic solvent layer whereby said (L)—R—NH—CHX—COOH is isolated in said second organic solvent layer;

(g) separating said second layers to thereby obtain a second organic fraction comprising said (L)—R—NH—CHX—COOH; and

(h) evaporating off said organic solvent from said second organic fraction layer to obtain (L)—R—NH—CHX—COOH.

4,205,184

METHOD FOR PROCESSING A TAR CONTAINING BENZYL BENZOATE

Cornelis Jongsma, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Dec. 27, 1977, Ser. No. 864,722
Claims priority, application Netherlands, Dec. 28, 1976, 7614458
Int. Cl.[2] C07C *63/08, 103/22, 31/16*
U.S. Cl. 562—494 10 Claims

1. Method for processing a tar consisting essentially of a benzyl benzoate and tar residue which is formed during the oxidation of an alkyl-benzene compound and which contains substituted or unsubstituted benzyl benzoate, comprising the steps of

(a) subjecting said tar which contains substituted or unsubstituted benzyl benzoate to a hydrolysis reaction, said reaction effected by means of sufficient aqueous basic solution, or an acid, or by using an acid ion exchange catalyst, at a temperature between about 30° C. and about 200° C. to convert essentially all of said benzyl benzoate to the corresponding benzyl alcohol and the corresponding benzoic acid or benzoate salt and provide a hydrolysis reaction mixture comprising an aqueous phase,

(b) contacting said hydrolysis reaction mixture with sufficient organic extracting agent having 12 at most carbon

atoms per molecule to cause said reaction mixture to separate into liquid phases, and to extract essentially all of the organic material except said benzoic acid or benzoate salt into the organic phase, and

(c) separating said liquid phases for further processing.

2. Method for processing a tar consisting essentially of a benzyl benzoate and tar residue which is formed during the oxidation of an alkyl-benzene compound and which contains substituted or unsubstituted benzyl benzoate, comprising the steps of,

(a) subjecting said tar which contains substituted or unsubstituted benzyl benzoate to an ammonolysis reaction, said ammonolysis reaction effected by means of sufficient ammonia, or liquid ammonia, or an amine, at a temperature between about 30° C. and about 200° C. to convert essentially all of said benzyl benzoate to the corresponding benzyl alcohol and the corresponding benzoic acid amide and provide an ammonolysis reaction mixture,

(b) contacting said ammonolysis reaction mixture with an organic extracting agent having at most 12 carbon atoms per molecule to cause said reaction mixture to separate into liquid phases, and to extract essentially all of the organic material except said benzoic acid amide into the organic phase, and

(c) separating said liquid phases for further processing.

4,205,185

PROCESS FOR PREPARING RACEMIC 4-HYDROXYPHENYLGLYCINE

Michael J. Elton, Newcastle; Arthur Jackson, Washington, and John W. Harrison, Newcastle upon Tyne, all of England, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 449,363, Mar. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 160,152, Jul. 6, 1971, abandoned. This application Aug. 31, 1978, Ser. No. 938,475

Int. Cl.[2] C07B *20/00*

U.S. Cl. 562—444 **7 Claims**

1. A process for the preparation of racemic 4-hydroxyphenylglycine, wherein, based on the total amount of hydroxyphenylglycine formed, less than about 10 percent is 2-hydroxyphenylglycine and greater than about 90 percent is 4-hydroxyphenylglycine, which comprises reacting in an aqueous medium and at a pH of 4 or greater:

(a) ammonia;

(b) phenol; and

(c) glyoxylic acid;

in a molar ratio of a:b:c of about 4:1.25:1 to about 19:13:1; at a temperature in the range of from about 20° C. to about 75° C.; and for a period of time sufficient to effect condensation of a, b and c to form the hydroxyphenylglycine.

4,205,186

PROCESS FOR PREPARING SUBSTITUTED OXYACETALDEHYDES AND ACETALS THEREOF

Mark A. Sprecker, Sea Bright; John J. Kryschuk, Howell, and John B. Hall, Rumson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

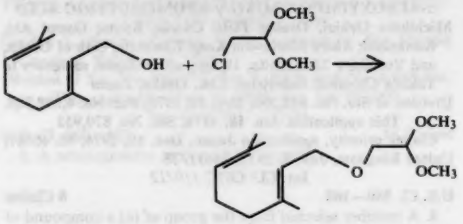
Continuation-in-part of Ser. No. 928,717, Jul. 27, 1978, abandoned, which is a division of Ser. No. 811,480, Jun. 30, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,883

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.[2] C07C *43/30*

U.S. Cl. 568—600 **2 Claims**

1. A process for producing a mixture of geranyl oxyacetaldehyde dimethyl acetal and neryl oxyacetaldehyde dimethyl acetal according to the reaction:



comprising the step of intimately admixing a mixture of geraniol and nerol with chloroacetaldehyde dimethyl acetal in the presence of a base selected from the group consisting of sodium hydroxide and potassium hydroxide and a phase transfer agent which is tricapryl methyl ammonium chloride; the reaction temperature being in the range of from 120° C. up to about 200° C.; the mole ratio of the mixture of geraniol and nerol to chloroacetaldehyde dimethyl acetal being between 0.5:1 up to 2:1; the mole ratio of mixture of geraniol and nerol to base being from 1:1 up to 1:2, the concentration or tricapryl methyl ammonium chloride in the reaction mass based on amount of chloroacetaldehyde dimethyl acetal being in the range of from 0.5 grams of tricapryl methyl ammonium chloride per mole of chloroacetaldehyde dimethyl acetal up to 25 grams of tricapryl methyl ammonium chloride per mole of chloroacetaldehyde dimethyl acetal; the reaction being carried out in the absence of solvent of in the presence of a solvent selected from the group consisting of xylene and decalin; then fractionally distilling the resulting product whereby the mixture of geranyl oxyacetaldehyde dimethyl acetal and neryl oxyacetaldehyde dimethyl acetal is recovered.

4,205,187

PROCESS FOR PREPARING P,P'-BIPHENOL OF HIGH PURITY

Jorge N. Cardenas, Somerville, and Walter T. Reichle, Warren, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 2, 1979, Ser. No. 120

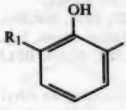
Int. Cl.[2] C07C *37/00*

U.S. Cl. 568—730 **5 Claims**

1. A process for producing p,p'-biphenol which comprises heating a 4,4'-bis(substituted phenol) at elevated temperatures below the decomposition temperature of p,p'-biphenol in the absence of a catalyst under an inert non-reactive atmosphere for the length of time sufficient to obtain a reaction product containing a substantial amount of p,p'-biphenol while removing the olefin by-product formed and then recovering the p,p'-biphenol product.

5. A process for producing p,p'-biphenol which comprises:

(a) contacting a phenol having the formula



wherein R_1 and R_2 may be the same or different and is a member selected from the group consisting of alkyl radicals containing from 2 to 10 carbon atoms, aralkyl radicals containing from 8 to 10 carbon atoms and having a β alkyl carbon—hydrogen group, and cyclic alkyl radicals having a β alkyl carbon—hydrogen group with oxygen or an oxygen containing gas in the presence of a catalytic quantity of a catalyst selected from the group consisting of alkali metal hydroxides, alkali metal salts of a weak acid, alkaline earth metal hydroxides, alkaline earth metal salts

of a weak acid, amine bases, and mixtures of the same at an elevated temperature for the time necessary to react up to a stoichiometric amount of oxygen with said phenol to form a reaction product containing a substantial amount of 4,4'-bis(2,6-disubstitutedphenol);

(b) dealkylating the substituent groups other than hydroxyl from said biphenol, said dealkylating comprises heating said biphenol reaction product at an elevated temperature below the decomposition temperature of p,p'-biphenol in the absence of a catalyst under an inert, non-reactive atmosphere for the length of time sufficient to obtain a reaction product containing a substantial amount of p,p'-biphenol while removing the olefin by-product formed, and then

(c) recovering said p,p'-biphenol.

4,205,188

PROCESS FOR THE PRODUCTION OF HYDROXYBENZYL ALCOHOLS

Wayne C. Muench; Thad S. Hormel; Pamela M. Kirchhoff, and Lanny A. Robbins, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 8, 1978, Ser. No. 940,698

Int. Cl.[2] C07C *37/24*

U.S. Cl. 568—764 **3 Claims**

1. In a process for the production of mixtures of ortho- and para-hydroxybenzyl alcohols formed during the sodium hydroxide-catalyzed condensation of phenol with aqueous formaldehyde in an alkaline solution, the improvement comprising the solvent extraction of unreacted phenol from the alkaline solution containing the hydroxybenzyl alcohol condensate, at temperatures between about 20° C. and about 60° C., with solvents selected from the group consisting of methyl ethyl ketone, methyl isobutyl ketone, and mixtures thereof.

4,205,189

METHOD FOR PRODUCING 3-ALKYLPHENOLS AND 1,3-DIHYDROXYBENZENE

Lewis B. Young, Skillman, and George T. Burress, Bridgewater, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,629

Int. Cl.[2] C07C *39/08, 179/02, 3/52*

U.S. Cl. 568—768 **16 Claims**

1. In the process for the production of hydroxybenzene compounds having substituents in the 1 and 3 positions on the benzene ring, said process comprising: (a) alkylation of an aromatic compound with an alkylating agent to produce an isomeric mixture of dialkylbenzene compounds; (b) separation of the isomers of said dialkylbenzene compounds to obtain a material enriched with respect to the 1,3-dialkylbenzene isomer; (c) oxidation of said material enriched with respect to said 1,3-dialkylbenzene isomer with oxygen to yield the hydroperoxide thereof; and (d) acid catalyzed rearrangement of said hydroperoxide by contacting the hydroperoxide with an inorganic acid or a cation exchange resin to yield a 1,3-disubstituted benzene compound having at least one hydroxyl substituent thereon; the improvement comprising

I. in alkylation step (a), carrying out said alkylation of said aromatic compound in the presence of a particular type of zeolite alkylation catalyst at a temperature of from about 100° C. to about 400° C. and a pressure of from about $10^5 N/m^2$ to about $4 \times 10^6 \times N/m^2$, said zeolite alkylation catalyst being characterized by a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12; and said improvement further comprising

II. in the separation step (b) contacting said isomeric mixture of dialkylbenzene compounds with a shape selective zeolite catalyst at a temperature of between about 150° C. and about 800° C. and a pressure of between about $10^4 N/m^2$ and about $10^7 N/m^2$, to selectively react the 1,4-dialkyl isomer of said dialkylbenzene compounds, the reaction mixture thereby becoming enriched with respect to the 1,3-dialkyl isomer thereof, said shape selective zeolite catalyst being characterized by a constraint index within the range of from about 1 to about 12 and further by a silica to alumina ratio of at least 12.

4,205,190

PROCESS FOR THE HYDROCARBONYLATION OF METHANOL TO ETHANOL IN THE PRESENCE OF ADDED OXYGEN-CONTAINING ORGANIC COMPOUNDS

Brian R. Gane, Weybridge, and David G. Stewart, Epsom, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Feb. 12, 1979, Ser. No. 11,190

Claims priority, application United Kingdom, Feb. 17, 1978, 06291/78

Int. Cl.[2] C07C *31/08*

U.S. Cl. 568—902 **12 Claims**

1. A process for the production of ethanol which process comprises contacting a mixture of methanol and synthesis gas at elevated temperature and pressure with a cobalt-containing catalyst in the presence of an additive which is deliberately charged to the reaction mixture, said additive being an oxygen-containing organic compound selected from the group consisting of acetaldehyde, 1,4-dioxan, tetrahydrofuran, di-n-propyl ether, and diphenyl ether.

4,205,191

HYDROCARBON HYDROGENATION USING ZERO VALENT METAL CATALYSTS

Murray S. Cohen, Convent Station, N.J.; Jan G. Noltes, Huis Ter Heide, and Gerard van Koten, Bilthoven, both of Netherlands, assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 827,278, Aug. 24, 1977, Pat. No. 4,152,303. This application Nov. 20, 1978, Ser. No. 962,268

Int. Cl.[2] C07C *5/02, 5/04, 5/06, 5/08*

U.S. Cl. 585—250 **6 Claims**

1. A process for the hydrogenation of aromatic, olefinic and acetylenic compounds comprising treating such compounds with hydrogen in the presence of a zero-valent metal catalyst prepared by reacting an organic metal cluster compound of the formula $Ar_{x+y}M_xLi_y$ where Ar is aromatic hydrocarbyl, M is a group 1B metal, and x and y are 1–4, with a metal halide complex of the formula TX_aL_b where T is a transition metal, X is halogen, L is an organic ligand, b is 1–4, and a is 1–3, in a hydrocarbon solvent.

4,205,192

PROCESS FOR PRODUCING 5-ALKYLIDENENORBORNENE

Tetsuya Harada, Tokyo, Japan, assignor to Japan Synthetic Rubber Company, Limited, Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,348

Claims priority, application Japan, Mar. 31, 1977, 52-35437

Int. Cl.[2] C07C *13/28*

U.S. Cl. 585—363 **12 Claims**

1. A process for producing a 5-alkylidenenorbornene, which comprises:

contacting a 5-alkenylnorbornene with a catalyst system of ammonia and at least one alkali metal hydride selected from the group consisting of lithium, sodium and potassium hydrides.

4,205,193

PROCESS FOR PRODUCTION OF ISOPRENE CYCLIC TRIMERS

Hiroyuki Morikawa, and Shooji Kitazume, both of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Jul. 26, 1978, Ser. No. 927,982
Claims priority, application Japan, Aug. 3, 1977, 52-93135
Int. Cl.[2] C07C *3/10, 3/21*
U.S. Cl. 585—367 **7 Claims**

1. A process for producing isoprene cyclic trimers which comprises catalytically oligomerizing isoprene to produce trimethylcyclododecatriene, by contacting said isoprene at a temperature of about room temperature to about 150° C. with a catalyst consisting essentially of a combination of:

(A) a tri-valent titanium compound;

(B) an organoaluminum compound;

(C) an oxygen-containing compound selected from the group consisting of:

(a) a carbonyl compound having the formula

wherein R^1 is a member selected from the group consisting of C_1–C_{10} alkyl, aryl, and aralkyl radicals; R^2 is a member selected from the group consisting of hydrogen, C_1–C_{10} alkyl, aryl, aralkyl, and OR^3 groups wherein R^3 is a member selected from the group consisting of C_1–C_{10} alkyl, aryl, and aralkyl radicals; and R^1 and R^2 may be combined with each other to form a cyclic structure, and

(b) an ether compound having the formula

where R^4 and R^5 each represents a member selected from the group consisting of C_1–C_{10} alkyl, aryl, and aralkyl radicals; and R^4 and R^5 may be combined with each other to form a cyclic structure; and

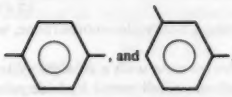
(D) a compound selected from the group consisting of:

(a) a sulfur-containing compound having the formula

where R^6 and R^7 each represents a member selected from the group consisting of hydrogen, C_1–C_{10} alkyl which can contain a thioether bond in its chain, aryl, and aralkyl radicals; and R^6 and R^7 may be combined with each other to form a cyclic structure, and

(b) a compound having the following formula

where Y and Y' each represents a member selected from the group consisting of CN, SCN, and SR^9 radicals wherein R^9 is a member selected from the group consisting of C_1–C_{10} alkyl, aryl, and aralkyl radicals; and R^8 is a member selected from the group consisting of $-(CH_2)_n-$ wherein n is an integer having a value of 1-10, inclusive,



wherein the mole ratio of compound (C)/compound (A) is about 0.1 to 10 and the mole ratio of compound (D)/compound (A) is about 0.5 to 5.

4,205,194

PROCESS FOR THE CONVERSION OF RELATIVELY LOW MOLECULAR WEIGHT HYDROCARBONS, TO HIGHER MOLECULAR WEIGHT HYDROCARBONS, CATALYST-REAGENTS FOR SUCH USE IN SUCH PROCESS, AND THE REGENERATION THEREOF

Howard L. Mitchell, III, and Robert H. Waghorne, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 903,814, May 8, 1978. This application Dec. 18, 1978, Ser. No. 970,540
Int. Cl.[2] C07C *3/44*
U.S. Cl. 585—407 **31 Claims**

1. The process for the oligomerization of a hydrocarbon feed which comprises

contacting said hydrocarbon feed with a catalyst-reagent comprising (1) a Group VIII noble metal having an atomic number of 45 or greater, nickel, or a Group I-B noble metal having an atomic number of 47 or greater, (2) a Group VI-B metal oxide which is capable of being reduced to a lower oxide, and (3) a Group II-A metal, composited with a spinel-coated inorganic oxide support,

at temperatures ranging from about 1150° F. to about 1600° F.

11. A process for the oligomerization of methane which comprises

contacting said methane with a catalyst-reagent comprising (1) a Group VIII noble metal having an atomic number of 45 or greater, nickel, or a Group I-B noble metal having an atomic number of 47 or greater, (2) a Group VI-B metal oxide which is capable of being reduced to a lower oxide, and (3) a Group II-A metal, composited with a spinel-coated inorganic oxide support,

at temperatures ranging from about 1150° F. to about 1600° F.

4,205,195

PROCESS FOR THE DIMERIZATION OF C_8-C_{20} OLEFINS AND THE OLEFIN DIMERS OBTAINED THEREBY

Michel Desbois, Rillieux, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Mar. 23, 1979, Ser. No. 23,288
Claims priority, application France, Mar. 28, 1979, 79 08852
Int. Cl.[2] C07C *3/10*
U.S. Cl. 585—510 **12 Claims**

1. A process of dimerizing C_8–C_{20} olefins in the presence of hydrofluoric acid, comprising:

(1) contacting for about 1 to 30 minutes at least one C_8–C_{20} olefin with liquid hydrofluoric acid at a temperature of between about −20° C. and +60° C. in a molar ratio of hydrofluoric acid to olefin of between about 1:1 and 50:1;

(2) immediately after the contacting operation, substantially instantaneously separating the hydrofluoric acid present from the dimerization medium;

(3) effecting a defluorination of said medium; and

(4) recovering the resultant olefin dimers.

4,205,196

ACID-TYPE HYDROCARBON ALKYLATION WITH ACID RECYCLE STREAMS AT SPACED POINTS OF A VERTICALLY-DISPOSED ELONGATED REACTOR

Donald J. Makovec, and Donald M. Haskell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1979, Ser. No. 27,426
Int. Cl.[2] C07C *3/54*; G01N *25/00*; B01J *8/00*
U.S. Cl. 585—701 **36 Claims**

1. A method of alkylating at least one alkylatable hydrocar-

bon with at least two different alkylating agents and an equal number of different reaction temperatures, respectively, in a single reaction zone and in the presence of an acid-type catalyst, comprising:

introducing a first alkylating agent, at least a portion of at least one alkylatable hydrocarbon and an acid-type catalyst at a first point adjacent the lower end of a vertically-disposed, elongated alkylation reaction zone and passing the same upwardly through said reaction zone;

introducing at least one other alkylating agent, differing from said first alkylating agent and from one another, into said reaction zone at at least one spaced, other point, above said first point and passing the same upwardly through said reaction zone;

passing effluent from the upper, discharge end of said reaction zone into a separation-surge zone;

separating said effluent into a hydrocarbon product phase and an acid phase in said separation-surge zone; and

maintaining different reaction temperatures adjacent each of said first point and said at least one other point by dividing the thus separated acid phase into a number of recycle acid phase streams equal to the number of said first point and said at least one other point and recycling one of said recycle acid phase streams to said reaction zone adjacent said first point and recycling each of said other streams of said number to said at least one other point respectively.

26. Apparatus for alkylating at least one alkylatable hydrocarbon with at least two different alkylating agents at an equal number of different reaction temperatures, respectively, in the presence of an acid-type catalyst comprising:

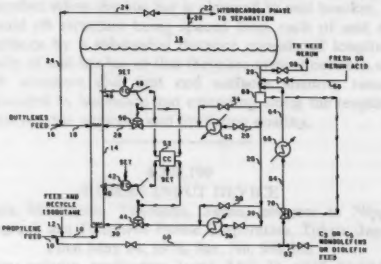
a vertically-disposed, elongated alkylation reactor means;

first alkylating agent feed conduit means operatively connected to said reactor adjacent the bottom thereof and adapted to introduce a first alkylating agent upwardly through said reactor;

at least one additional alkylating agent feed conduit means operatively connected to said reactor at an equal number of separate points above said first alkylating agent conduit and adapted to introduce at least one additional alkylating agent upwardly through said reactor;

at least one alkylatable hydrocarbon feed conduit means operatively connected to said reactor and adapted to introduce at least one alkylatable hydrocarbon into said reactor at one of the point of introduction of said first alkylating agent, the point of introduction of said at least one additional alkylating agent or both the point of introduction of said first alkylating agent and the point of introduction of said at least one additional alkylating agent;

separator-surge means operatively connected to the upper, outlet end of said reactor and adapted to receive effluent from said reactor and to separate said effluent into a hydrocarbon product phase and a recycle catalyst phase; and



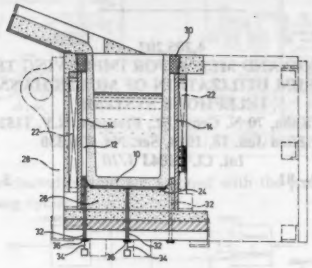
recycle catalyst conduit means operatively connected to said separator-surge means and said reactor and adapted to receive the thus separated recycle catalyst phase and introduce one portion of said recycle catalyst phase into said reactor adjacent one of said point of introduction of said first alkylating agent and said point of introduction of said at least one additional alkylating agent and the remainder of said recycle catalyst phase into said reactor adjacent the other of said point of introduction of said first alkylating agent and said point of introduction of said at least one additional alkylating agent.

4,205,197

INDUCTION FURNACE OF GRAPHITE CRUCIBLE

Tsuguharu Omori, and Michio Kawasaki, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Nov. 28, 1978, Ser. No. 964,297
Claims priority, application Japan, Dec. 2, 1977, 52-160884
Int. Cl.[2] H05B 5/12
U.S. Cl. 13—27 5 Claims



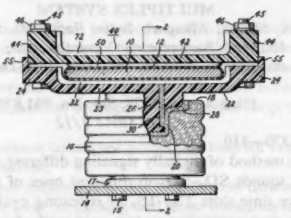
1. An induction furnace comprising a supporting housing having a furnace bed and surrounding furnace walls, a graphite crucible located within said housing in upright position, a thermal insulated outer sheath having a height less than said furnace wall and surrounding said crucible, a coil wound about the exterior of said sheath, said crucible and said sheath being mounted on said furnace bed spaced from each other to define an annular air space therebetween closed at its bottom end and open at its upper end, a removable seal for closing the upper end of said air space comprising an annular member having a wedge shaped cross section insertible between the inner periphery of said furnace wall and the outer periphery of said crucible and having a frontal edge adapted to seat on the upper end of said thermal sheath, and at least one conduit extending through the furnace base in communication with said air space for the removal of molten metal therefrom.

4,205,198

BUS STRUCTURE COMPRISING AN INSULATING SUPPORT AND A COATED ELECTRIC BUS BAR

Malachy V. Boyle, Narberth, Pa., and Mid Ouyang, Cherry Hill, N.J., assignors to General Electric Company, Philadelphia, Pa.

Filed Jul. 10, 1978, Ser. No. 923,290
Int. Cl.[2] H01B 17/18
U.S. Cl. 174—171 8 Claims



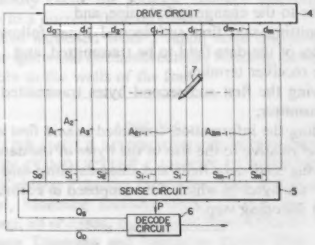
1. In electric bus structure:
(a) a bus bar,
(b) a post-type insulator supporting said bus bar and having an end surface facing said bus bar,
(c) a coating of insulating material completely covering all external surfaces of said bus bar in the general region of said insulator,
(d) a bracket of insulating material with a U-shaped cross-section mounted on said insulator and having a bight portion extending across said end surface and a pair of spaced-apart arms at opposite ends of said bight portion extending in a direction away from said insulator,
(e) means clamping said bus bar to said bracket in a position between said arms without perforating said insulating coating comprising a clamping member of insulating material extending between said arms and attached thereto,
(f) said bracket and said clamping member each having end surfaces located at points spaced apart along the length of said bus bar,
(g) said bracket and said clamping member each having rib structure projecting toward said bus bar and providing the sole surfaces through which contact is made between the coating on said bus bar and the bracket and clamping member when the bus bar is clamped to said bracket,
(h) said rib structure being spaced from each of said end surfaces by a substantial distance considered longitudinally of said bus bar so that there are present between said rib structure and said end surfaces shallow tunnels bounded by insulation and extending along the length of said bus bar adjacent said insulating coating.

4,205,199

TABLET INPUT DEVICE

Tamotsu Mochizuki, Yokosuka, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed May 24, 1978, Ser. No. 909,282
Claims priority, application Japan, May 31, 1977, 52-63477; May 31, 1977, 52-63478; Jun. 2, 1977, 52-65040; Jun. 7, 1977, 52-66935; Jun. 7, 1977, 52-66936; Jan. 31, 1978, 53-8816
Int. Cl.[2] G08C 21/00
U.S. Cl. 178—19 16 Claims

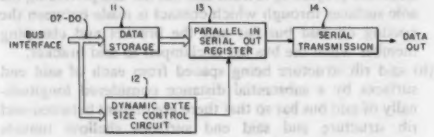


1. A tablet input device comprising
(a) a manipulation pad consisting of
a drive line group consisting of a plurality of parallel conductors, and
a sense line group consisting of a plurality of parallel conductors,
said groups being parallel to each other and mutually interlaced;
(b) a drive circuit connected to said drive line group for selecting sequentially one or more drive lines and passing a variable drive current through said selected drive line or drive lines;
(c) a sense circuit connected to said sense line group for selecting one or more sense lines at the positions corresponding to said one or more selected drive lines and detecting the voltage induced across said one or more selected sense lines, at least two lines of one group and one line of the other group disposed therebetween being simultaneously selected; and
(d) an input pen for coupling together adjacent drive and sense lines at any selected point on said manipulation pad;
whereby when said variable drive current flows through said one or more selected drive lines adjacent to the point indicated by said input pen, said sense circuit may detect voltage induced across said one or more selected sense lines, thereby detecting the point selected by said input pen.

4,205,200
DIGITAL COMMUNICATIONS SYSTEM UTILIZING CONTROLLABLE FIELD SIZE

Bipin D. Parikh; Haresh C. Patnaik; Bhagubhai K. Patel, all of Cambridge, Ohio; Prabodh M. Dharia, Des Plaines, Ill., and John J. Kurtz, Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 4, 1977, Ser. No. 839,483
Int. Cl.[2] H04J 3/16
U.S. Cl. 370—83 14 Claims



1. In a digital data communications system wherein data is assembled from its constituent bytes at a transmitter terminal, serially transmitted, and disassembled into its constituent bytes at a receiver terminal, a method of controlling the byte size of the data serially transmitted from said transmitter terminal and received at said receiver terminal without the use of filler bits, comprising the steps of:

at the transmitter terminal,

generating a first byte which contains information as to whether there is to occur a change in the size of data bytes transmitted, and the size of the data bytes transmitted subsequent to the change,

generating a second byte which contains information representative of the number of data bytes to be transmitted prior to the change in byte size, and

transmitting said first and second bytes followed by the bytes of the data field to be transmitted, and

at the receiver terminal,

receiving the first and second bytes transmitted from said transmitter,

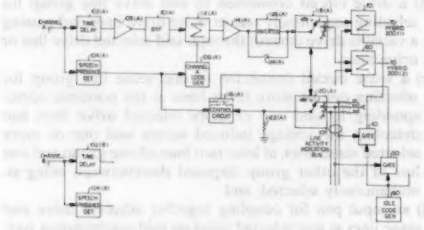
decoding the information contained in said first and second bytes relative to the size of the bytes of the data field, and

receiving said data field and disassembling said data field into the bytes of which it is composed in accordance with said decoding step.

4,205,201
METHOD AND MEANS FOR REDUCING INTELLIGIBLE CROSSTALK IN TELEPHONE SYSTEMS

Leonard R. Kahn, 137 E. 36 St., New York, N.Y. 10016

Division of Ser. No. 870,330, Jan. 18, 1978. This application Oct. 10, 1978, Ser. No. 950,012
Int. Cl.[2] H04J 6/02
U.S. Cl. 370—81 5 Claims



1. The method of improving the line utilization efficiency of a multichannel telephone system comprising:

(a) sensing speech activity of a channel,

(b) selecting a line from an inactive group of lines to transmit the speech sensed in Step (a), and subsequently connecting the channel's speech wave to the selected line,

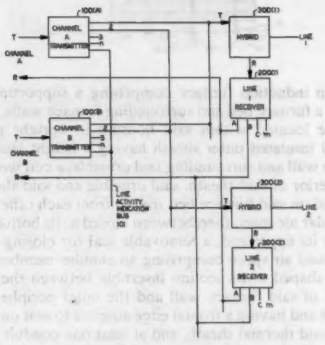
(c) rapidly transmitting the initial channel identification information over substantially the entire bandwidth of the selected line to the remote end of the line, and

(d) transmitting continuous channel verification information in a narrowband slot in the passband of the line concurrently with the transmission of the speech.

4,205,202
METHOD AND MEANS FOR IMPROVING THE SPECTRUM UTILIZATION OF MULTICHANNEL TELEPHONE SYSTEMS

Leonard R. Kahn, 70 N. Grove St., Freeport, N.Y. 11520

Filed Jan. 18, 1978, Ser. No. 870,330
Int. Cl.[2] H04J 3/10
U.S. Cl. 370—81 5 Claims



1. The method of implementing a TASI type system utilizing transmission lines of the two wire configuration comprising;

(a) separating talk and listen signals at junctions of two wire and four wire lines and rendering crosstalk, due to imperfect separation, unintelligible by,

(b) encoding the speech transmitted in one direction differently than speech transmitted in the other direction, and

(c) decoding the encoded speech at the far end of the system.

4,205,203
METHODS AND APPARATUS FOR DIGITALLY SIGNALING SOUNDS AND TONES IN A PCM MULTIPLEX SYSTEM

Madhu A. Mehta, Alkapuri, India; Satyan G. Pitroda, Villa Park, Ill., and Sagunabalan Vasanthkumar, Kareli Baug, India, assignors to Wescom Switching, Inc., Downers Grove, Ill.

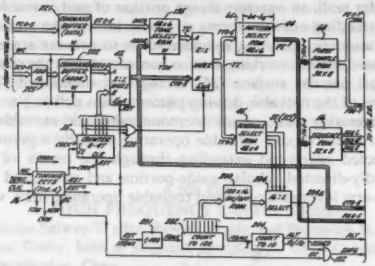
Filed Aug. 8, 1978, Ser. No. 931,876
Int. Cl.[2] H04J 3/12
U.S. Cl. 370—110 110 Claims

1. The method of digitally signaling different ones of a plurality of sounds SD_o-SD_n in different ones of a plurality of successive time slots TS_o-TS_n of repeating cycles in a PCM multiplex communication system, said method comprising

(a) for each sound SD_o-SD_n initially storing in addressable, readable main memory—as multi-bit digital numerical words—a pattern of successive samples representing the sampled magnitudes of at least a symmetrical portion of an analog wave corresponding to the desired sound,

(b) during and only within the duration of each time slot, applying address signals to said main memory to effect readout to a common bus of one sample of a preselected pattern for that slot, and

(c) as each cycle transpires, changing the address signals so applied during each time slot so that the samples of the



preselected pattern are scanned with the passage of ongoing cycles.

4,205,204

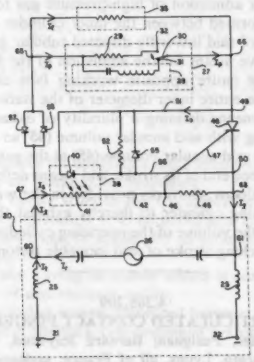
TELEPHONE LOOP EXTENDING APPARATUS

Richard W. Clenney, 812 59th St., NW., Bradenton, Fla. 33505

Continuation-in-part of Ser. No. 775,429, Mar. 8, 1977, Pat. No. 4,140,881. This application Oct. 25, 1978, Ser. No. 954,370

Int. Cl.[2] H04M *1/76*

U.S. Cl. 179—16 F 11 Claims



1. A loop extender for a telephone system including a central office, a subscriber loop which conducts a loop current and a termination of said subscriber loop, said termination being selectively operable to draw a predetermined off hook current from said central office through said subscriber loop, comprising:

a shunt resistance connected across said loop for conducting a shunt current;

control means responsive to said loop current flowing in said subscriber loop for causing said shunt resistance to vary in an inverse relationship to said loop current until said shunt current reaches a first predetermined value; and

switching means for providing a substantially instantaneous increase in said shunt resistance in response to said shunt current reaching said first predetermined value;

wherein said switching means renders said control means unresponsive to said loop current upon the occurrence of said increase until said loop current reaches a second predetermined value less than said predetermined off hook current.

4,205,205

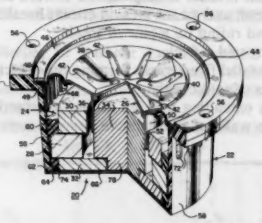
DYNAMIC LOUDSPEAKER HAVING MAGNETIC ASSEMBLY ADHESIVELY BONDED WITHIN A SURROUNDING BASKET

Burton A. Babb, Dallas County, Tex., assignor to Babbco, Ltd., Richardson, Tex.

Filed Jun. 12, 1978, Ser. No. 914,782

Int. Cl.[2] H04R *9/06, 31/00*

U.S. Cl. 179—115.5 R 13 Claims



2. A loudspeaker comprising:

a magnetic assembly forming an annular flux gap;

a frame having a peripheral flange adapted for mounting the loudspeaker in a suitable baffle, and walls extending rearwardly from the flange and forming a cylindrical liquid container disposed around the magnetic assembly and spaced therefrom to form an annular space,

an acoustic radiator assembly peripherally suspended within the frame, and having a voice coil reciprocally disposed in the annular flux gap, the voice coil being adapted to acoustically excite the acoustic radiator assembly in response to a current flowing therein; and

an adhesive hardened from a liquid state disposed in the annular space and circumferentially bonding the magnetic assembly to the walls of the frame.

4,205,206

CARBON GRANULE MICROPHONE WITH MOLDED RESIN-CONDUCTIVE CARBON ELECTRODE

Tetsusuke Eishima; Takehiro Ikariyama, both of Tokyo; Raizo Jinnouchi, Machida; Kunioki Oyagi, Tokyo, and Takashi Soda, Inagi, all of Japan, assignors to Iwatsu Electric Co. Ltd. and Nippon Telegraph and Telephone Public Corp., both of Tokyo, Japan

Continuation of Ser. No. 736,408, Oct. 28, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 886,156

Claims priority, application Japan, Oct. 31, 1975, 50-130324; Dec. 15, 1975, 50-148455

Int. Cl.[2] H04R *21/02*

U.S. Cl. 179—124 8 Claims

1. A carbon telephone transmitter comprising:

a diaphragm;

a movable electrode attached to said diaphragm;

a fixed electrode; and

a pack of carbon granules packed between said movable and said fixed electrodes, at least one of said electrodes comprising a cured thermosetting resin molding having 30 to 95% by weight, based on the weight of the electrode, of particulate conductive carbon dispersed therein.

4,205,207

DRAW OUT CIRCUIT BREAKER ASSEMBLY

Challiss I Clausing, Marlton, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 16, 1978, Ser. No. 869,777

Int. Cl.[2] H01H *9/20*

U.S. Cl. 200—50 AA 9 Claims

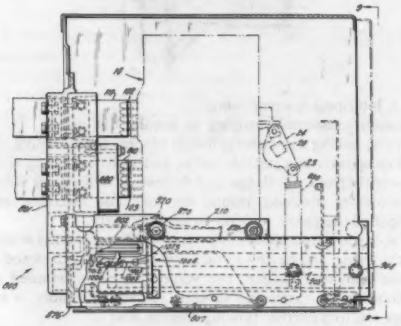
1. In a switchboard having a cubicle for a draw-out circuit breaker; said cubicle having a plurality of buses at the rear

thereof, side walls, a bottom wall, a front opening and means for closing said front opening; a circuit breaker insertable in said cubicle movable therein toward and away from the rear thereof and removable from said cubicle; said circuit breaker including movable and stationary contacts and means for closing and opening said contacts; said circuit breaker also having sets of upper and lower disconnect contacts extending from the portion of the circuit breaker directed toward the rear of the cubicle when the circuit breaker is inserted in the cubicle; racking means on said circuit breaker for cooperating in moving said circuit breaker in said cubicle toward and away from the rear thereof; and means on said circuit breaker for cooperating with and riding on a pair of tracks;

a cradle for said cubicle;

a pair of parallel fixed tracks forming the principal structural members of said cradle;

said tracks extending parallel to and substantially adjacent said side walls of said cubicle from an area substantially



adjacent said rear of said cubicle to said front opening of said cubicle;

said cradle having a bottom wall connecting said tracks;

a vertical support wall of insulating material at the rear of said cradle supported between and connected to said tracks;

means for securing said cradle in said cubicle;

upper and lower sets of stationary disconnect contacts;

openings in said vertical support wall of said cradle receiving and supporting said upper and lower stationary disconnect contacts; and

means for connecting said stationary disconnect contacts to their respective buses; and

means connected to said vertical support wall engageable with said racking means of said circuit breaker and providing a stationary anchor with respect to which the racking means of said circuit breaker may operate to draw the circuit breaker into the cubicle and to push the circuit breaker toward the front of the cubicle.

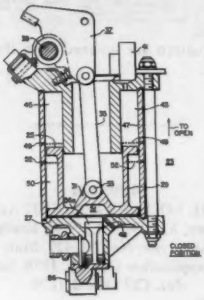
4,205,208

DOUBLE-FLOW COMPRESSED-GAS OPERATING MECHANISM FOR A HIGH-VOLTAGE CIRCUIT-BREAKER

Ben J. Calvino, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1978, Ser. No. 887,283
Int. Cl.[2] H01H *35/38*
U.S. Cl. 200—82 R **3 Claims**

1. In combination, a high-voltage, compressed gas circuit-interrupting structure having one or more separable contacts to effect the opening and closing of a connected circuit, operating means for moving the contacts between open and closed positions, means defining a stationary operating cylinder having an inwardly-directed tubular guide-portion extending therewithin and thus forming an annular chamber (**45**), the operating means comprising a movable double-flanged driving piston having one flange portion thereof slidable and guided by said inwardly directed tubular guide-portion and with the outer periphery of said flange portion guided by an inner cylinder wall, an opposite flange portion of said movable piston extending entirely across an entire inner cross-section of the stationary operating cylinder so as to present a greatly-increased surface working area, as contrasted with the relatively-small annular surface (**25**) of the first mentioned flange portion of the movable driving piston, means defining a rotatable operating shaft, means interconnecting said movable piston structure to said rotatable operating shaft by a pivotally-connected piston-rod extending through the center of said inwardly-directed tubular guide-portion and connected to a crank-arm lever affixed to said rotatable operating shaft, valve



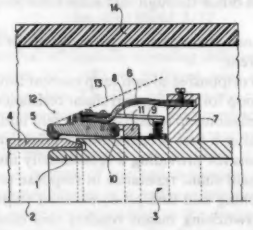
means (**41**) for admission of high-pressure gas to the annular volume (**45**) formed between the inner cylinder wall and the outer surface of said inwardly-directed tubular guide-portion, additional valve means for the admission of the high-pressure gas across the entire opposite working face of said piston throughout the entire inner diameter of the stationary operating cylinder, means defining a plurality of exhaust apertures communicating with said annular volume (**45**) so as to exhaust the gas within said annular volume (**45**) at the end of the movable piston at one end of its stroke, and means defining a plurality of other exhaust apertures provided in the wall of the stationary operating cylinder to thereby exhaust the high-pressure gas from the volume of the operating cylinder at the other end of the working stroke of said movable piston.

4,205,209

ARTICULATED CONTACT FINGER

Edmond Thuries, Pusignan; Bernard Raynaud, Caluire, and Armand Scarato, Lyons, all of France, assignors to Societe Anonyme Dite: Delle-Alsthom, Villeurbanne, France

Filed Feb. 7, 1979, Ser. No. 10,281
Int. Cl.[2] H01H *1/38, 1/50, 33/02*
U.S. Cl. 200—163 **4 Claims**



1. A longitudinally extending articulated contact finger assembly for a circuit-breaker, to establish an electrical connection between a longitudinally separable stationary contact

and a moving contact, said finger assembly including a contact piece, means for pivoting said contact piece about a pin which is integral with a first support mechanically connected to the stationary contact, a spring for providing a force to press the contact piece against the moving contact, a flexible connection connected to a second support mechanically and electrically connected to the stationary contact, the improvement wherein said pin is disposed longitudinally between the contact piece and said spring, said spring is a compression spring and disposed between said stationary contact and a lever integral with said contact finger.

4,205,210
HIGH FREQUENCY CAVITY PRESS

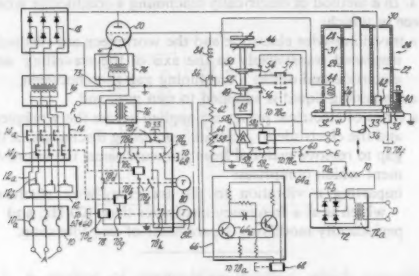
Malcolm Salway-Waller, Rowley Fields, and Frederick H. Langton, Groby, both of England, assignors to USM Corporation, Farmington, Conn.

Continuation-in-part of Ser. No. 767,773, Feb. 11, 1977, abandoned, which is a continuation of Ser. No. 638,331, Dec. 8, 1975, abandoned. This application Jan. 4, 1978, Ser. No. 866,934

Claims priority, application United Kingdom, Dec. 20, 1974, 55256/74

Int. Cl.[2] H05B *9/04*; B29C *27/04*; C09J *5/06*

U.S. Cl. 219—10.81 **4 Claims**



1. An apparatus for applying a high frequency electric field and pressure on workpieces comprising:

a resonant cavity wherein the workpiece on which a high frequency operation is to be performed can be enclosed and pressure can be applied by an arrangement of platen members;

a triode tube having an anode which is connected to the interior of said resonant cavity;

a variable tuning means connected between a grid on said tube and a feedback coil contained within said resonant cavity;

a voltage applying means for applying a first, lower, voltage, or a second, higher, voltage to said tube;

operating means for varying said variable tuning means while said first voltage is applied to said tube, thereby causing the grid current of said tube to increase and a high frequency field to be built up in said resonant cavity, said voltage applying means comprising switching means operable upon the grid current attaining a predetermined value to replace said first voltage by said second voltage;

signaling means sensitive to changes in the grid current of said tube for causing said operating means after said second voltage has been applied to said tube to vary said variable tuning means so as to bring the grid current to a second predetermined value and thereafter to return the grid current to said value should it deviate therefrom;

holding means arranged to maintain the grid current at the maximum value attained should the grid current fail to attain the second predetermined value;

a relay operable to switch from the first to the second voltage in response to a current sensor arranged to sense the grid current of said tube;

a timing means arranged to switch off the high frequency field in said resonant cavity after a predetermined time interval; and

a second timing means which is arranged to release the pressure on said workpiece after a further predetermined time interval.

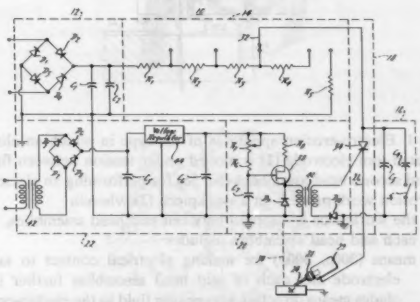
4,205,211
SURFACE ALLOYING APPARATUS INCLUDING SAFETY CIRCUIT

Richard A. Serlin, 10 Barbour La., Bloomfield Hills, Mich. 48013, and Thomas A. Field, Rochester, Mich., assignors to Alloying Surfaces, Inc., Troy, Mich. and Richard A. Serlin, Bloomfield Hills, Mich.

Filed Nov. 23, 1977, Ser. No. 854,134

Int. Cl.[2] B23K *9/10*

U.S. Cl. 219—76.13 **2 Claims**



2. For a surface alloying apparatus including an electrode adapted to be electrically energized and to engage a workpiece to form an alloy upon the surface of said workpiece, and energization means for said electrode including storage means for storing electrical energy and firing means connected between said storage means and said electrode for repetitively providing electrical energy stored by said storage means to said electrode including controlled conduction means having a control terminal and at least one other terminal for causing energization of said electrode and triggering circuit means connected between said control terminal and said other terminal for providing a triggering signal to said controlled conduction means for causing said controlled conduction means to conduct to cause energization of said electrode, the improvement comprising:

said triggering circuit means being series connected in circuit with said electrode and said workpiece so as to open circuit said triggering circuit means when said electrode is not engaged with said workpiece and to close circuit said triggering circuit means when said electrode is engaged with said workpiece thereby being responsive to the electrical engagement of said electrode to said workpiece for preventing firing of said firing means when said triggering circuit means is open circuited consequent said electrode being not electrically engaged with said workpiece and for causing firing of said firing means when said triggering circuit means is closed circuited consequent said electrode being electrically engaged with said workpiece, said triggering circuit means being associated with said controlled conduction means such that said triggering signals for causing conduction of said controlled conduction means are provided to said controlled conduction means only when said trigger circuit means is closed circuited by electrical engagement of said electrode and said workpiece.

4,205,212
ELECTRO-EROSION MACHINE TOOLS AND HEAD ASSEMBLIES THEREFOR

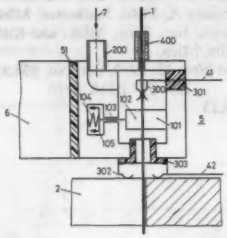
Werner Ullmann, Locarno; Ernst Bühler, Tenero; Beat Kilcher, Ascona; Herbert Ruh, Laupen-Wald, and Arno Sieg, Locarno, all of Switzerland, assignors to A.G. für industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Apr. 26, 1977, Ser. No. 791,055

Claims priority, application Switzerland, Aug. 20, 1976, 10633/76

Int. Cl.² B23K *1/12*

U.S. Cl. 219—69 W 11 Claims



1. Electro-erosion apparatus of the type in which an elongated tool electrode (**1**) is moved under tension between first and second head assemblies (**5***a*, **5***b*) for performing an electro-erosion work process on a workpiece (**2**) wherein

the workpiece is disposed between said head assemblies,

each said head assemblies includes

means (**300***a*, **300***b*) for making electrical contact to said electrode and each of said head assemblies further includes means directing scavenging fluid to the electro-erosion location working gap,

wherein each of said assemblies comprises a housing;

fluid inlet means (**200***a*, **200***b*) leading to the interior of the respective housing for passing scavenging fluid (**7***a*, **7***b*) to the respective interior of the respective housing to fill the respective housing;

an outlet nozzle (**303**) defining an opening between the interior and the exterior of the respective housing through which a tool electrode can pass from one housing to the other, and through which scavenging fluid also can pass from the interior of the respective housing as an envelope surrounding and in contact with said tool electrode, and being directed toward the workpiece;

electrical contacts (**300***a*, **300***b*) mounted in the respective interior of the respective housing and being cooled by the scavenging fluid therein and in electrical contact engagement with said tool electrode;

and tool electrode guide means (**100***a*, **100***b*) mounted in the interior of the respective housing, each guide means being cooled by the scavenging fluid within the respective housing and guiding said tool electrode in its path through said outlet means, at least one of said guide means comprising two support members (**101**, **102**), two parallel pivot pins (**119**) attached to respective ones of said support members, a first set of polygonal guide plates (**115**, **116**) rotatably mounted one above another on one of said pivot pins, and a second set of polygonal guide plates (**117**, **118**) rotatably mounted one above another on the other of said pivot pins, said plates being so arranged in relation to one another that edge portions thereof bound a space in which said tool electrode can be located so that said edge portions are in sliding contact with said tool electrode and such that, for each plate, there is another one of said plates which is at the same level on said pivot pins and which contacts said tool electrode on the opposite side thereof.

4,205,213
METHOD OF AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING WITH A VIBRATING WIRE ELECTRODE

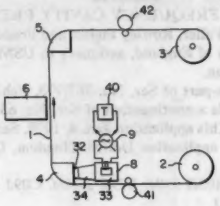
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed May 12, 1977, Ser. No. 796,369

Claims priority, application Japan, May 14, 1976, 51-55743; May 20, 1976, 51-58271; Jul. 21, 1976, 51-87614; Jul. 23, 1976, 51-88376; Aug. 19, 1976, 51-99306; Feb. 18, 1977, 52-16175

Int. Cl.² B23P *1/12*

U.S. Cl. 219—69 W 25 Claims



1. In a method of electrically machining a conductive workpiece in which:

a travelling-wire electrode and the workpiece are relatively displaced transversely to the axis of the travelling wire electrode and define a machining gap therebetween,

a machining liquid is supplied to said gap, and

a series of electrical pulses are applied across the workpiece and the electrode to generate machining discharges in the gap to remove material from the workpiece, the improvement which comprises:

imparting a vibration to the travelling-wire electrode which is at a frequency not lower than 100 Hz; and

periodically modifying a parameter of said vibration.

4,205,214
APPARATUS FOR MACHINING FLASH AND UPSET MATERIAL FORMED IN FLASH WELDING OPERATION

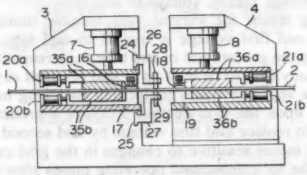
Takao Suzuki; Yoshimasa Komatsu, both of Chita; Akimichi Takeda, and Toshihiko Baba, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Steel Corporation, both of Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,225

Claims priority, application Japan, Jul. 12, 1977, 52-83456

Int. Cl.² B23K *11/04*

U.S. Cl. 219—97 6 Claims



1. An apparatus for machining flash and upset material formed on a workpiece in a flash welding operation, said apparatus comprising:

a pair of main clamps for clamping a workpiece, said main clamps being disposed so as to face a weld line;

a pair of electrode tables for feeding a welding current to said workpiece, said electrode tables being disposed nearer to said weld line than said main clamps and being adapted to be shifted relative to said weld line;

a tool holder adapted to be movably inserted into a space

between said electrode tables and adapted to be movable in said space along said weld line;

means for shifting said electrode tables relative to said weld line;

means for moving said tool holder in said space along said weld line; and

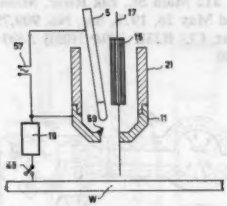
at least one tool held by said tool holder, whereby the shifting of said electrode tables permits said tool holder to move with said tool along said weld line so as to machine said flash and upset material formed around said welding line.

4,205,215

METHOD AND DEVICE FOR WELDING IN A THERMALLY IONIZED GAS

Gerardus A. M. Willems, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 778,602, Mar. 17, 1977, abandoned.
This application Jan. 23, 1978, Ser. No. 871,712
Claims priority, application Netherlands, Mar. 31, 1976, 7603320
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 P **8 Claims**



1. A method of plasma-MIG welding, which comprises flowing a thermally ionizable inert gas past a non-consumable electrode out through a nozzle toward a workpiece; establishing a plasma arc between said non-consumable electrode and said workpiece to initiate and sustain a plasma flow; feeding a consumable electrode in an axial direction through said plasma flow and out through said nozzle toward the workpiece; establishing a MIG-arc between said consumable electrode and said workpiece; and supplying power for establishing said MIG-arc to the consumable electrode at a point downstream of said non-consumable electrode.

4,205,216

LASER WELDING SYSTEM AND METHOD

Robert R. Douglas, Omaha, Nebr., assignor to Western Electric Company, Inc., New York, N.Y.

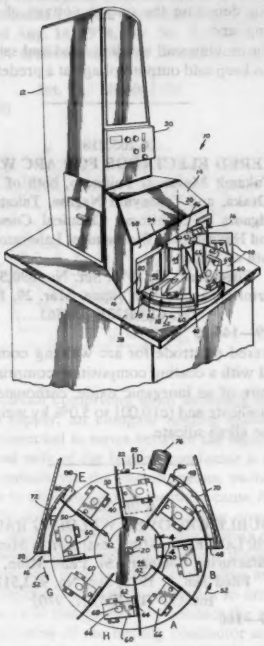
Filed Sep. 26, 1978, Ser. No. 945,963
Int. Cl.² B23K 26/00
U.S. Cl. 219—121 L **16 Claims**

1. A laser welding system comprising a housing having an opening through which workpieces may be passed;

means for generating and directing a laser beam into a welding station within said housing;

light trap means for inhibiting light from passing from said welding station through said opening to the exterior of said housing and

conveyor means for conveying workpieces with step by step intermittent motion between workpiece loading and unloading stations located externally of said housing and said welding station through said housing opening and said light trap means whereby workpieces may be loaded and unloaded from the conveyor means at the loading and unloading stations as another workpiece is simultaneously



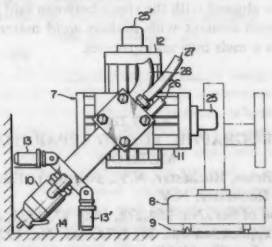
welded at the welding station while the conveyor means is momentarily stationary.

4,205,217

AUTOMATIC WELD LINE COPYING APPARATUS

Takeshi Araya, Shimoinayoshi, and Tsugio Udagawa, Tomobemachi, both of Japan, assignors to Hitachi, Ltd. and Hitachi Seiko Ltd., both of, Japan

Filed Dec. 29, 1976, Ser. No. 755,427
Int. Cl.² B23K 9/12
U.S. Cl. 219—124.34 **5 Claims**



1. An automatic weld line copying apparatus comprising:

a welding head;

at least one sensor means including a fixed core, primary winding means wound around said core and excited with a signal having a desired current characteristic, and secondary winding means including a plurality of secondary coils differentially wound substantially directly over the

outer circumference of said primary winding means, said sensor means being mounted on said welding head such that said sensor means is spaced from a base metal to be welded when applied to welding process;

means for detecting the output voltage of said secondary winding; and

means for moving said welding head and said sensor means so as to keep said output voltage at a predetermined value.

4,205,218

COVERED ELECTRODE FOR ARC WELDING

Kousuke Fukami; Masanori Fujimoto, both of Ibaraki; Fumio Fujita, Osaka, and Tsuneyuki Nagase, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., Okayama, both of, Japan

Filed Mar. 27, 1978, Ser. No. 890,506

Claims priority, application Japan, Mar. 29, 1977, 52-35725

Int. Cl.[2] B23K *35/365*

U.S. Cl. 219—145.23 **2 Claims**

1. A covered electrode for arc welding comprising a core wire coated with a coating composition comprising (a) a powdered mixture of an inorganic oxide, carbonate and fluoride, (b) an alkali silicate and (c) 0.001 to 5.0% by weight of pullulan based on the alkali silicate.

4,205,219

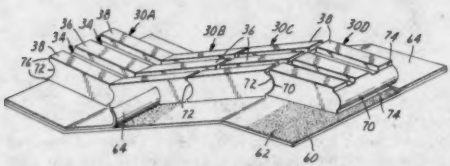
DOUBLE GROOVED WELDING BACKUP

John B. Snell, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 7, 1978, Ser. No. 913,511

Int. Cl.[2] B23K *5/22, 9/02*

U.S. Cl. 219—160 **14 Claims**



12. An improved heat resistant welding backup useful in welding two slightly spaced apart plates, said backup having a generally planar working face with two parallel grooves therein, a central ridge disposed between said grooves and substantially flat lands at the sides of said grooves, said ridge adapted to be aligned with the space between said plates and to be melted upon contact with molten weld material to thereupon flow as a melt into said grooves.

4,205,220

ELECTROGRAPHIC FUSING APPARATUS AND METHOD

Robert J. O'Brien, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 254,278, May 17, 1972, abandoned. This application Jul. 29, 1974, Ser. No. 492,797

Int. Cl.[2] H05B *1/00*; G03G *15/00*

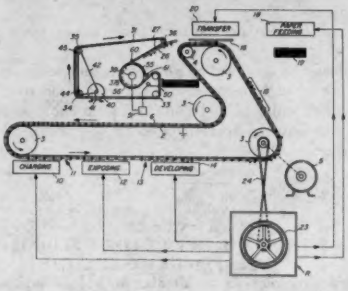
U.S. Cl. 219—216 **5 Claims**

1. An improved flash fusing apparatus for fusing toner images onto a copy sheet comprising:

an elongated flashlamp,

a cylindrically shaped member circling said flashlamp along the longitudinal axis thereof, and

means for positioning a copy sheet bearing toner images along the cylindrical member to form a circular path around said flashlamp whereupon energizing said lamp



uniform direct radiation is imparted to the sheet to fuse the toner particles at a reduced power output.

4,205,221

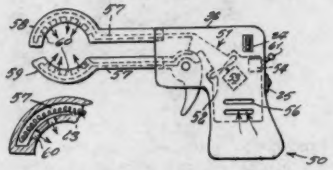
ELECTRICALLY HEATED SOLDERING TOOL HAVING WORK GRIPPING JAWS

Hugo G. Meyer, 312 Main St., Elk River, Minn. 55330

Filed May 26, 1978, Ser. No. 909,792

Int. Cl.[2] B23K *3/04*; H05B *1/00*

U.S. Cl. 219—230 **3 Claims**



1. In an electric heat gun, the combination of a case, said case including a pistol-grip handle portion adapted to be held in a person's hand, an upper stationary jaw secured to said case and extending forwardly from a front end thereof, a pivotable lower jaw pivotable toward and away from said upper jaw, said lower jaw being pivotable about a transverse pin supported laterally in said case, said lower jaw extending forwardly from the front end of said case, and arranged in juxtaposed relation to the upper jaw for clamping an object therebetween, a trigger-like lever protruding from said case, and being positioned relative to said handle, for being squeezed by an operator's finger while holding said handle, said trigger-like lever being connected to said pivotable lower jaw for pivoting said pivotable jaw about said pin, heating means associated with each of said jaws for heating said jaws, and means associated with said case for energizing said heating means, said heating means comprising an electric heating element within an interior of each of said jaws, said means for energizing said heating elements comprising an electric circuit extending into an interior of said case, said electric circuit including an on-off switch and an indicator lamp supported by said case, an electric extension cord extending outwardly of said case, and an outer end of said extension cord having a male plug for connection to a household electric socket, and the confronting portions of each said jaws being approximately semi-cylindrical in shape, so that, together, they can grasp around a cylindrical pipe when the pivotable jaw is moved toward the stationary jaw by said lever for heating said pipe; each of said jaws being interchangeably removable from said case, each of said jaws having a pair of jack-like prongs and adapted to be inserted into a jack-like socket, said prongs being electrically

connected to said heating element in said jaw and said jack-like socket forming a part of said electric circuit, one of said jack-like sockets being integral with said case, and the other of said jack-like sockets being carried on an arm that is integral with the free end of said trigger-like lever pivotable about said transverse pin; said electric heat gun additionally including a separately controlled forced air draft system that includes a motor-driven fan associated with said case and operated by a manually triggered switch button, an air duct extending from said fan into each of said jaws, and a plurality of radially extending openings on the confronting portion of each jaw and communicating with said air duct for directing air against a surface of a work held by said jaws.

4,205,222

ELECTRODE TYPE WATER HEATING BOILER

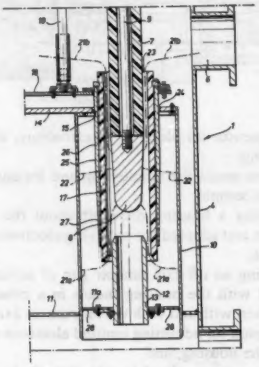
Stanley A. Williams, 10, Durlston Rd., Poole, Dorset BH14 8PQ, England

Filed Jan. 10, 1978, Ser. No. 868,342

Claims priority, application United Kingdom, Jan. 14, 1977, 1461/77

Int. Cl.[2] H05B *3/60*; H01C *10/02*

U.S. Cl. 219—290 **12 Claims**



1. A high tension electrode hot water boiler comprising an elongated casing; an inlet for admitting water into said casing; an outlet for leading heated water from said casing, said inlet and outlet being spaced in the elongated direction of said casing; a high tension electrode within said casing and electrically insulated therefrom; a counter-electrode spaced from said electrode; an electrically-insulating shield spaced from said electrode and said counter-electrode to provide first and second regions for flow of water between said electrode and said shield and between said shield and said counter-electrode, respectively; means for selectively moving said shield between said electrode and said counter-electrode to vary the length of the path of a major portion of the current flowing between said electrode and at least part of said counter electrode; and means associated with at least one of said electrode, counter-electrode and shield for varying, in dependence on the length of said current path, the ratio of the area available for the flow of water, as it passes from said inlet to said outlet, in said first region relative to the available area of said second region, said ratio decreasing as the length of said current path is decreased by movement of said shield relative to said electrode and said counter-electrode.

4,205,223

HEATING CIRCUITS FOR DETECTION OF LOCALIZED OVERHEATING

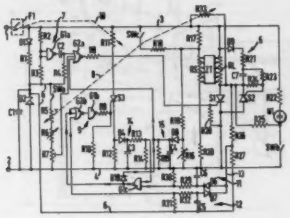
Graham M. Cole, Lymington, England, assignor to Dreamland Electrical Appliances Limited, Southhampton, England

Filed Aug. 14, 1978, Ser. No. 933,604

Claims priority, application United Kingdom, Aug. 15, 1977, 34214/77

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—501 **10 Claims**



1. A heating circuit comprising input terminals for connection to an AC supply, an elongate heating conductor and switch means connected in series between the input terminals such that one end only of the heating conductor is connected to the input terminals via the switch means, switch control means operative to close the switch means to cause AC current to flow from the supply through the heating conductor, an elongate sensor conductor spaced from the heating conductor, temperature sensitive means disposed between the heating and sensor conductors and responsive to overheating at any position along the length of the heating conductor to drop substantially in impedance at that position to connect the sensor conductor to the potential of the heating conductor at that position, means to cause the control means, whilst the control means is operative to close the switch means, to periodically open the switch means so that the heating conductor is at substantially the same potential along its length, and sensing means to sense the potential on the sensor conductor during each periodic opening of the switch means and responsive to the potential being such as to indicate that there is an overheat at any position along the length of the heating conductor to prevent subsequent re-closure of the switch means.

4,205,224

BINOCULAR VIEWING TECHNIQUE

Richard A. Mecklenborg, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jul. 11, 1978, Ser. No. 923,661

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—201 **16 Claims**

1. A method for the binocular viewing of images in proper perspective optically displayed through a common display to each eye of one or more movable observers, whereby only an image corresponding with a particular eye is viewed at said particular eye, such that each observer can view said display using retinal disparity comprising the steps of:

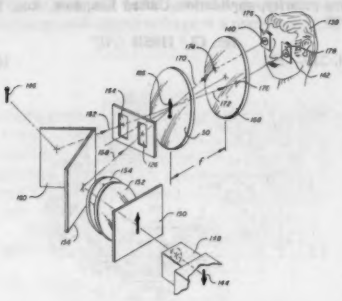
a. developing each of said images corresponding with a particular eye such that said proper perspective is determined by the location of the eyepoints relative to said images;

b. projecting of each of said developed images through corresponding aperture stop pupils so that said developed images are coincidentally focused upon optical transfer means, whose orientation is capable of change without changing images focused thereon;

c. defining said display as having optical properties such that each of said images focused upon said transfer means are viewed by their respective eyepoints, and real images of

each of said corresponding pupils are simultaneously focused at each of said respective eyepoints; and

d. controlling said optical transfer means orientation such that said real images of said corresponding aperture stop pupils continuously track said respective eyepoints when



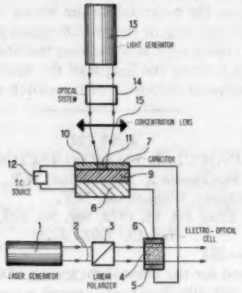
said eyepoints change location, thereby allowing each of said individual images, as confined by their respective real pupil images, to be viewed at their corresponding eyepoints in their proper perspective without optical interference from any other of said developed images.

4,205,225

METHOD OF GENERATING AN ELECTRIC PULSE OF PREDETERMINED SHAPE AND APPLICATION TO CUTTING OUT A PORTION FROM A LASER PULSE

Denis LeGoff, Saint Cyr l'Ecole, France, assignor to Compagnie Generale d'Electricite, Paris, France

Filed Aug. 21, 1978, Ser. No. 935,290
Claims priority, application France, Aug. 25, 1977, 77 25940
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—229 **8 Claims**



1. A method of generating an electric pulse of predetermined waveform, said method comprising the steps of:

providing a capacitor having first and second plates, the first plate being connected to a conductor by a portion of semiconductor material which is rendered conductive by the application of light thereto,

connecting said conductor and the second plate of the capacitor to respective poles of a DC source;

illuminating said semiconductor material with a sequence of light pulses of intensity sufficient to enable an electric charge to accumulate on the capacitor at each pulse thereby causing the capacitor to charge following a staircase charging curve;

adjusting the duration of the intervals of time which separate two successive light pulses in accordance with a predetermined program, so that the average of the staircase charging curve of the capacitor has a waveform which approximates the rising portion of the predetermined waveform; a variation in one direction of the duration of an interval of time causing a variation in the opposite direction of the instantaneous gradient of the curve; and

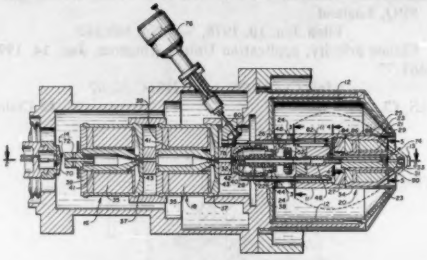
after illumination, equalizing the potentials of the plates so as to discharge the capacitor along a curve whose form is substantially identical to that of the falling portion of the predetermined waveform.

4,205,226

AUGER ELECTRON SPECTROSCOPY

Robert Gerlach, Minnetonka, Minn., assignor to Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 1, 1978, Ser. No. 938,842
Int. Cl.[2] H01J *39/00*
U.S. Cl. 250—305 **38 Claims**



1. In an apparatus for electron spectroscopy, the improvement comprising:

magnetic lens means for condensing and focusing electrons onto a test sample;

means defining a housing disposed about the axis of the instrument and adapted for receiving electrons emitted by the sample;

means defining an off-axis annular gap of adjustable width associated with the housing means in a concentric relationship therewith and with the instrument axis, the means being adapted for admitting emitted electrons through the gap into the housing, and

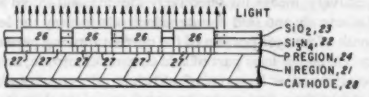
electron detector means positioned within the housing proximate the gap for detecting electrons admitted through the gap.

4,205,227

SINGLE JUNCTION EMITTER ARRAY

Bruce S. Reed, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 745,153, Nov. 26, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,657
Int. Cl.[2] H01J *31/50*
U.S. Cl. 250—330 **3 Claims**



2. In an infrared detection system, a light emitter array comprising:

(a) a substrate of n-type conductivity semiconductor material having opposing first and second major surfaces;

(b) a surface passivation layer and an oxide mask layer, said

layers selectively covering portions of the first major surface of the substrate to form an uncovered portion;

(c) a diffused stripe of a p-type conductivity material diffused in the uncovered portion of the first major portion of the substrate to form an elongated p-n junction; and

(d) a plurality of selectively spaced contacts formed on the oxide mask layer and in contact with the diffused stripe of p-type semiconductor material, and at least one contact in electrical contact with the second major surface of the substrate said contacts for connection to a source of power for providing from a single p-n junction an array of light emitting diodes whereby each diode is responsive substantially independent of adjacent diodes.

4,205,228

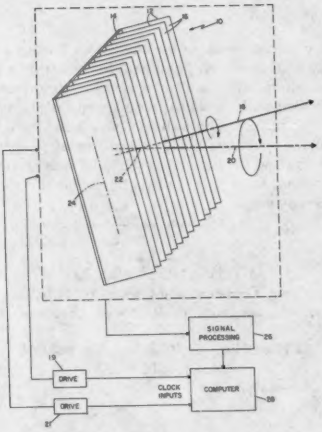
FAR FIELD IMAGING

Christopher H. Tosswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Jul. 3, 1978, Ser. No. 921,200

Int. Cl.[2] G01T *1/00*; G01J *1/20*

U.S. Cl. 250—336 **7 Claims**



1. Apparatus for imaging distant radiation sources, comprising

a collimator having an axis along which radiation can be transmitted through said collimator,

a first drive for rotating said collimator about said axis,

a second drive for moving said collimator to cause said collimator axis to move through a path about a fixed axis pointing toward the field of view of the collimator, and

means for detecting radiation passing through said collimator during its rotation about said collimator axis, for different positions of said collimator axis along said path,

each pair of values of the angular position α of said collimator about said collimator axis, and the position β of said collimator axis along said path, at the time radiation passes through said collimator, defining a response plane,

said response planes intersecting in at least one line pointing at a radiation source in said field of view.

4,205,229

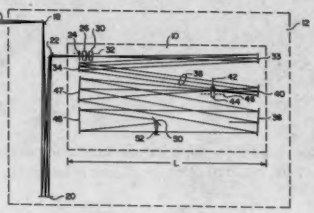
COOLED ECHELLE GRATING SPECTROMETER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Reinhard Beer, Glendale, Calif.

Continuation of Ser. No. 646,333, Jan. 2, 1976, abandoned. This application Oct. 31, 1978, Ser. No. 956,529

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—352 **7 Claims**



1. An echelle grating infrared spectrometer comprising:

an entrance aperture;

an echelle grating;

a dispersing grating which is cross-oriented with respect to said echelle grating;

infrared detection means;

means for angularly positioning said dispersing grating so that predetermined echelle orders are directed to said detection means;

a first collimating means for collimating infrared radiation from said entrance aperture, said collimated infrared radiation being directed to said dispersing grating;

an intermediate aperture;

a first focusing means for focusing ordered infrared radiation reflected from said dispersing grating on a plane defined by said intermediate aperture,

a second collimating means for collimating infrared radiation passing through said intermediate aperture, said collimated infrared radiation being directed to said echelle grating;

a second focusing means for focusing further ordered infrared radiation reflected from said echelle grating on said detection means; and

means for cooling said dispersing grating, echelle grating and said detection means so that infrared radiation entering through said entrance aperture, ordered by said dispersing grating, and further ordered by said echelle grating is detected by said detection means.

4,205,230

SOLID MATERIALS FLOW RATE MEASUREMENT

Raymond F. Stubbs, Osborne Park, Australia, assignor to Pretron Electronics Pty. Ltd., Osborne Park, Australia

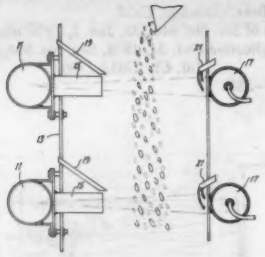
Filed Aug. 29, 1977, Ser. No. 828,674

Int. Cl.[2] G01F *1/00*

U.S. Cl. 250—356 **23 Claims**

1. The method of measuring the mass flow rate of a freely flowing material flowing under the force of gravity through a path comprising the steps of measuring the density of flow at a

first sensing location, measuring the mass density of flow at a second sensing location spaced a predetermined vertical distance below said first sensing location and computing the mass flow rate of the material from the measurements thus obtained.

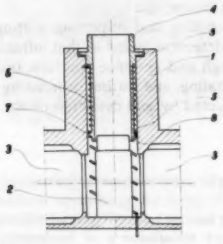


4,205,231

DEVICE FOR LIGHT FLUX ATTENUATION, ESPECIALLY FOR ADDITIONAL QUENCHING OF SCINTILLATIONS AT RADIONUCLIDE ACTIVITY DETERMINATION

Krzysztof K. Pochwalski, Warsaw, Poland, assignor to Instytut Badan Jadrowych, Warsaw, Poland

Filed Oct. 10, 1978, Ser. No. 950,312
Claims priority, application Poland, Oct. 12, 1977, 201490
Int. Cl.[2] G01T *1/20, 1/00;* G02B *9/00*
U.S. Cl. 250—364 8 Claims



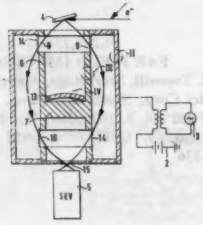
1. Apparatus for light flux attenuation for additional quenching of scintillations in the determination of radionuclide activity, said apparatus comprising a counting chamber, a counting vial in said chamber serving as a light source, photomultiplier tubes optically coupled with said counting vial in spaced relation therewith to serve as light detectors, a coil spring including coils disposed between said counting vial and photomultiplier tubes and means for adjusting the spacing between said coils to serve as an adjustable light diaphragm.

4,205,232

ARRANGEMENT FOR PREVENTING THE ALTERATION OF THE PRIMARY BEAM BY UNWANTED PARTICLES, SUCH AS SPUTTER PRODUCTS, CHARGED IONS AND ELECTRONS AND THEIR SECONDARY PROCESSES

Uwe Maixner, Barum, and Dieter Milferstädt, Tespe-Bütlingen, both of Fed. Rep. of Germany, assignors to Gesellschaft für Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthact-Tesperhude, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 827,307, Aug. 24, 1977, Pat. No. 4,123,655. This application Aug. 29, 1978, Ser. No. 937,729
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831791
The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.
Int. Cl.[2] H01J *35/16;* G01K *1/08*
U.S. Cl. 250—397 17 Claims



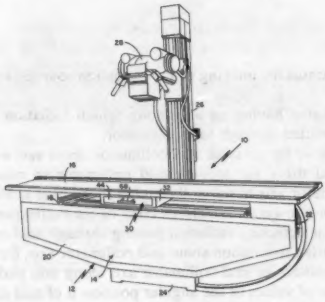
1. An electron or ion beam instrument having a surface of the instrument along the beam path formed from a metal having a low atomization rate and a very low desorption rate and also provided with closely spaced apertures extending an incline to the surface with a diameter of less than 0.5 mm, the depth of the apertures being at least equal to their opening cross section and the total cross sectional area of the apertures corresponding to at least half of the metal surface in which they are provided.

4,205,233

AUTOMATIC BUCKY LOCK

James R. Craig, Glenview, and George W. Otto, Jr., Elmhurst, both of Ill., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 22, 1978, Ser. No. 963,064
Int. Cl.[2] G01N *21/00*
U.S. Cl. 250—439 R 18 Claims



1. A fluoroscopic table comprising a base, a top position on said base, a bucky positioned beneath said top, operating means for moving said bucky beneath the top and longitudinally thereof, said bucky comprising a boxlike frame having a front

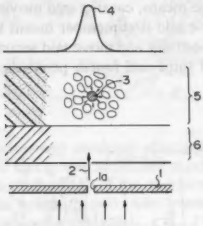
opening and a tray slidable into and out of the frame through said opening, and means responsive to selective positioning of said tray within the frame for immobilizing said bucky selected positions of said tray within the frame.

4,205,234

INTENSIFYING SCREENS

Yujiro Suzuki, Odawara; Keiji Shimiya, and Takashi Miyagawa, both of Hiratsuka, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Jan. 16, 1978, Ser. No. 870,016
Claims priority, application Japan, Jan. 17, 1977, 52-3697
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—483 **5 Claims**



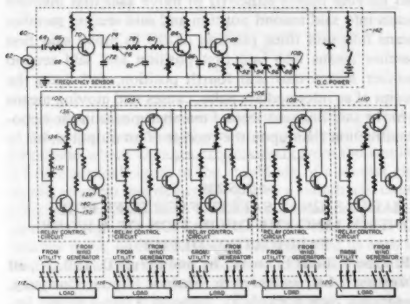
1. A radiographic intensifying screen comprising a support having applied thereon a fluorescent layer containing a pigment coated phosphor wherein pigment particles adhere to the surface of a phosphor and partly absorb the light emitted by said phosphor wherein the reflectance of said pigment at the main peak of the emission spectrum of said phosphor is within the range of 20 to 80% when the reflectance of magnesium oxide plate is defined to be 100%.

4,205,235

AUTOMATIC ELECTRICAL LOAD MATCHING DEVICE FOR WIND GENERATORS

Dharam Pal; Kwang T. Huang, both of Ventura, and Maurice N. Smith, Oxnard, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 884,075
Int. Cl.[2] H02P *9/04*
U.S. Cl. 290—44 **7 Claims**



1. In a device having a rotatable means responsive to a moving fluid having a variable velocity, said device generating alternating current power having a frequency related to the velocity of said fluid, apparatus responsive to the frequency of the generated power for selectively coupling and decoupling the generated power to a plurality of loads, which comprises:

a. means for generating a direct current signal proportional to the frequency of the generated power; and

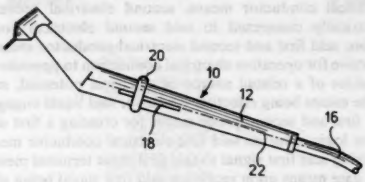
b. switch means responsive to said direct current signal for selectively coupling and decoupling the generated power to the plurality of loads.

4,205,236

FINGER OPERATED CONTROL SYSTEM FOR HAND-HELD APPLIANCES

Sven K. L. Goof, Gammel Strandvej 236 B, Humlebaek, Denmark (DK-3050)

Division of Ser. No. 667,831, Mar. 17, 1976. This application Aug. 10, 1977, Ser. No. 823,422
Claims priority, application Denmark, Mar. 20, 1975, 1184/75; Mar. 20, 1975, 1185/75
Int. Cl.[2] H01H *35/24*; A61C *3/02*
U.S. Cl. 307—118 **11 Claims**



1. A hand-held appliance comprising a handle portion and at least one finger-operable control device for controlling a variably actuatable device associated with said appliance;

said control device comprising a sealed and compressible enclosure member mounted on said handle portion, said enclosure member being filled with a working fluid;

said enclosure member having a wall portion which is movable responsive to displacements in said working fluid upon squeezing said enclosure member against said handle portion, the movable wall portion being formed as part of a protruding tubular branch portion with a free end extending into the interior of said handle portion; and

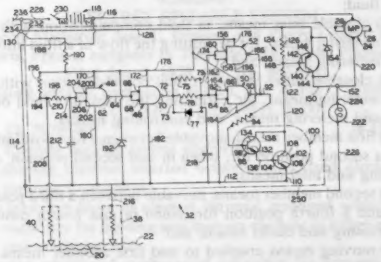
said movable wall portion being operatively connected with a movable member of a control unit in said handle portion, said control unit being arranged to variably control said actuatable device dependent on the extent of moving said movable member, whereby said actuatable device is variably actuated responsive to the degree of squeezing said enclosure member against said handle portion.

4,205,237

LIQUID LEVEL SENSOR, PUMP SYSTEM MEANS AND CIRCUIT MEANS

Gerald K. Miller, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Dec. 16, 1977, Ser. No. 861,435
Int. Cl.[2] H01H *35/18*
U.S. Cl. 307—118 **27 Claims**



2. Liquid level sensing apparatus, comprising first gate

means having first input terminal means and first output terminal means, second gate means having second input terminal means and second output terminal means, third gate means having third input terminal means and third output terminal means, control transistor means, output power circuit means, power transistor means in said output power circuit means, said first output terminal means being electrically operatively connected to said second input terminal means, said second output terminal means being electrically operatively connected to said third input terminal means, said third output terminal means being electrically operatively connected to said control transistor means, said control transistor means being electrically operatively connected to said power transistor means, first electrical conductor means of a first electrical potential electrically connected to said first input terminal means, second electrical conductor means of a second electrical potential relatively less than said first electrical potential, first electrical probe means electrically connected to said first electrical conductor means, second electrical probe means electrically connected to said second electrical conductor means, said first and second electrical conductor means being effective for operative electrical connection to opposite electrical sides of a related source of electrical potential, said first probe means being effective whenever said liquid engages both said first and second probe means for creating a first signal of a first logic value on said first electrical conductor means and applying said first signal to said first input terminal means, said first gate means upon receiving said first signal being effective to produce a second signal of a second logic value at said first output terminal means for application to said second input terminal means, said second gate means upon receiving said second signal on said second input terminal means being effective to produce a third signal of said first logic value at said second output terminal means for application to said third input terminal means, said third gate means upon receiving said third signal on said third input terminal means being effective to produce a fourth signal of said second logic value at said third output terminal means for application to said control transistor means, said control transistor means being effective upon receiving said fourth signal to switch from a first of its states to a second of its states, and said power transistor means being effective to switch from a first of its states to a second of its states when said control transistor switches from its said first state to its said second state.

4,205,238

DIGITAL ELECTRONIC APPARATUS AND CASETTE SIZED FOR INTRAVENOUS FLUID-FLOW LIMITING EQUIPMENT

Norman Shim, Glenview, and Vincent L. Knigge, Mundelein, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 17, 1978, Ser. No. 878,846
Int. Cl.[2] G06M *3/02*; A61M *5/14*
U.S. Cl. 235—92 CT **40 Claims**

1. In a controller for use with a casette having:

(a) metering means for holding a predetermined volume of a fluid;

(b) closable inlet means, in fluid communication with said metering means, for permitting the flow of a fluid into said metering means; and

(c) closable outlet means, in fluid communication with said metering means, for permitting the flow of a fluid out of said metering means, said controlling having:

(a) first member means, movable between a first position and a second position for, when in said second position, closing said inlet means;

(b) second member means, movable between a third position and a fourth position for, when in said fourth position, closing said outlet means; and

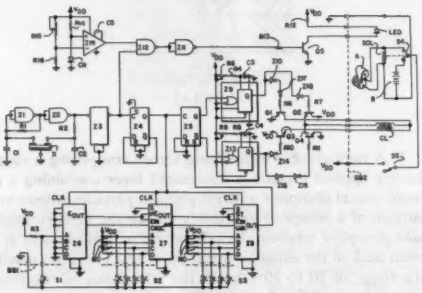
(c) moving means coupled to said first member means and said second member means for moving said first member means between said first and second positions and said second member means between said third and fourth positions; and

(d) regulating means, coupled to said moving means, for controlling the operation of said moving means, the improvement wherein said regulating means comprises:

(A) crystal controlled oscillating means for producing digital pulses at a predetermined first frequency of less than 1 MHz;

(B) digital gate means coupled to said oscillating means for, upon the receipt of pulses at said first frequency from said oscillating means, providing output pulses at a second frequency which is less than half of said first frequency; and

(C) responding means coupled to said gate means and to said moving means for, upon the receipt of an output pulse from said gate means, causing said moving means to alternatingly move said first member means between said first and second positions and move said second member means between said third and fourth positions; said digital gate



means including (1) binary divider means coupled to said oscillating means, for producing, at regular intervals, intermediate pulses equal in number to the number of electronic pulses divided by a positive integral power of two, and (2) variable rate-divider means coupled to said binary divider means, for producing said second predetermined number of said output pulses with said second predetermined number being less than one third the number of said intermediate pulses, and wherein said responding means receives said intermediate pulses and said output pulses and, upon receipt of an output pulse, causing said moving means either (i) to move said first member means into said second position and said second member means into said third position or (ii) to move said first member means into said first position and said second member means into said fourth position, and upon the receipt of an intermediate pulse, causes said moving means to move said first and second member means in the opposite direction than upon the receipt of an output pulse.

4,205,239

RADIO SIGNAL SAFETY FACILITIES FOR CONTROLLING THE OPERATION OF A WORK FABRICATING DEVICE

Jerold F. Arts; William L. Owen, Jr., and Bernie D. Tull, Jr., all of Shreveport, La., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,325
Int. Cl.[2] G05B *9/03*
U.S. Cl. 307—328 **12 Claims**

1. A safety system for controlling a work fabricating device, which comprises:

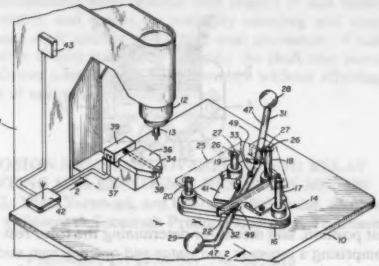
a radio transmitter for transmitting a predetermined signal;

a work holder;

means for supporting the work holder for movement to and from the work fabricating device;

a pair of spaced electrodes mounted on said work holder, said spacing of said electrodes being sufficient to insure that an operator must individually grasp an electrode in each hand;

circuit means including said electrodes connected to said



radio transmitter and rendered effective by the operator grasping said electrodes to initiate a consequent flow of current through the body of the operator and between the electrodes for operating said radio transmitter to transmit said predetermined signal; and

means responsive to the receipt of said predetermined signal for controlling the operation of the work fabricating device.

4,205,240

DEVICE FOR PROGRESSIVE ELECTRICAL SWITCHING

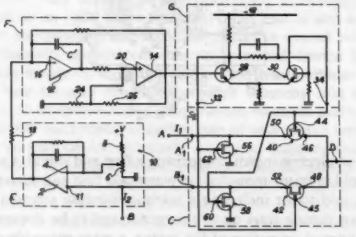
Yves Plaige, Bures-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 11, 1977, Ser. No. 840,527

Claims priority, application France, Oct. 15, 1976, 76 31061

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—350 **4 Claims**



1. A device for progressive electrical switching for obtaining at the output thereof an electrical output signal having a mean amplitude which changes progressively from the amplitude of a first electrical signal to the amplitude of a second electrical signal, wherein said device comprises: a switch unit constituted essentially by two first switches mounted in parallel, each switch being provided with one input, one output and one control input, one of the signals being applied to each input of said switches, the outputs of said switches being connected to a common output terminal of the device at which said electrical output signal is obtained, a logical control unit for controlling said switching unit in order to produce two logical control signals S_1 and S_2, one of said signals being applied to each control input of the switching unit, each signal being capable of assuming a first logical level for closing said first switches and a second logical level for opening said first switches, the two signals S_1 and S_2 being such as to have different logical levels at each instant, said logical control unit being provided with means for giving the first logical level to the signal S_1 during a first period and a second logical level to said signal during a second period and for giving to the same signal during an intermediate period between the first and the second periods alternately the first logical level and the second logical level with a predetermined frequency so as to ensure that the successive time durations during which the said signal has the first logical level decrease progressively when passing from the first period to the second period.

4,205,241

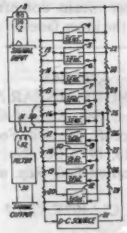
QUANTIZED MODULATION SYSTEMS

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison, Montreal, Quebec, Canada (H3R 1K3)

Filed Mar. 13, 1979, Ser. No. 20,175

Int. Cl.[2] H03C *1/52, 3/00;* H03F *3/38;* H03K *13/175*

U.S. Cl. 307—361 **5 Claims**



1. A quantizing modulation system for a signal which comprises:

a plurality of sensing means which compare said signal amplitude against the amplitudes of a plurality of equally spaced voltages extending across the amplitude range of said signal, said spacing being equal to or less than the smallest signal amplitude step to be reproduced, each of said sensing means sensing the instant at which the amplitude of said signal is substantially equal to a different one of said equally spaced voltages, and

a plurality of switching means, each of which is associated with and is operated by one of said sensing means when said signal amplitude is substantially equal to one of said equally spaced voltages, and

output means comprising a plurality of terminals on a network, each of which terminals is connected by one of said switching means to an output circuit, said network including one or more sources of power, and

filter means connected to said output circuit, so that the output of said filter means is a function of said signal amplitude.

4,205,242

ELECTRET BISTABLE SYSTEM

Francois Micheron; Jean L. Bruneel, and Pierre Leclerc, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,341

Claims priority, application France, Jan. 4, 1977, 77 00076

Int. Cl.[2] G11C *13/02;* H01H *36/00*

U.S. Cl. 307—400 **8 Claims**

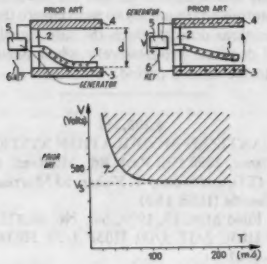
1. Electret bistable system comprising:

a moving element inserted between two fixed electrodes forming a capacitor:

at least one layer of electret material arranged within said capacitor for holding said moving element in either of two rest positions; and

means positioned within said capacitor for lowering the electrostatic force holding said moving element near one

of said two fixed electrodes, said force being created by said layer of electret material, said means comprising spacer means interposed between said moving element



and said two fixed electrodes respectively in said two rest positions, said spacer means comprising solid dielectric layers deposited on the inner faces of said fixed electrodes.

4,205,243

SYNCHRONOUS LINEAR MOTOR

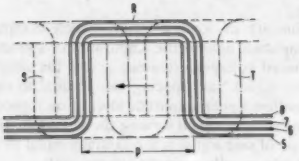
Stenio Lingaya, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,192

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1976, 2656389

Int. Cl.[2] I02K *41/02*

U.S. Cl. 310—13 **2 Claims**



1. In an iron-free synchronous long stator linear motor, having an exciter disposed as a comoving translator on a track bound vehicle, and having a traveling field winding subdivided into switching sections which are supplied from a stationary, controlled static frequency changer, the improvement comprising the traveling field winding being a plurality of conductors disposed and connected electrically in parallel so as to reduce the operating reactance, said plurality of conductors having spacings with respect to each other which are uneven so as to minimize excitation flux interlinkage.

4,205,244

MICRO STEPPING MOTOR

Yasuhiro Fukushima, Ichikawa, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

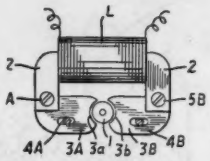
Division of Ser. No. 556,200, Mar. 6, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 760,828

Claims priority, application Japan, Mar. 7, 1974, 49-26655; Jun. 25, 1974, 49-72509; Jul. 8, 1974, 49-78098; Jul. 8, 1974, 49-80436[U]; Aug. 29, 1974, 49-103672[U]

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—49 R **10 Claims**

1. A micro stepping motor for use in compact watches and the like comprising: a magnetic core; a coil winding wound on said magnetic core; a stator composed of a solid one-piece plate having opposite end portions thereof connected to said magnetic core to define therewith a closed magnetic flux path, said stator having a symmetrical necked portion of reduced cross-sectional area along its length and having a circular hole extending through said stator at the center of said necked portion; a rotor having a pair of magnetic poles rotatably disposed in said hole with an air gap therebetween; and means disposed at only one site around the circumference of said hole and coacting with said rotor for determining the rotor stationary or



rest position, said means for determining the rotor rest position comprising a recess in said stator and opening into said hole at said site thereby forming a region in the air gap of maximum reluctance for the rotor flux at said site so that said rotor assumes a rest position in which said pair of magnetic poles are equally spaced from said recess.

4,205,245

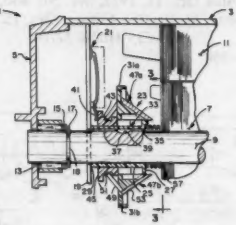
CENTRIFUGAL ACTUATOR FOR ELECTRIC MOTOR STARTING SWITCH

Eugene F. Hildebrandt, and Herbert G. Fellner, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 24, 1978, Ser. No. 927,145

Int. Cl.[2] H02K *11/00*

U.S. Cl. 310—68 E **7 Claims**



1. In an electric motor comprising a first end shield, a second end shield, a stator mounted between said first and second end shields, said stator including a starting winding adapted to be energized during start up of the motor and to be deenergized during normal operation of the motor, a rotor rotatable within said stator, a shaft affixed to said rotor and being journalled in said end shields for rotation with said shaft and rotor, a motor starting switch for energizing said starting winding during startup of the motor and for deenergizing said starting winding once the motor has attained a predetermined operating speed, a centrifugal actuator carried by and rotatable with said shaft, and linkage means interconnecting said centrifugal actuator and said motor starting switch for actuation of the latter, said centrifugal actuator including a main body mounted on and rotatable with said shaft, a switch actuator member operatively connected to said motor starting switch via said linkage, said switch actuator member being carried by said main body for rotation with the latter and being movable axially relative to said main body member between a first position in which said motor starting switch is actuated to energize said starting winding and a second position in which said motor starting switch is actuated to deenergize said starting winding, centrifugal means carried by said main body responsive to the speed of

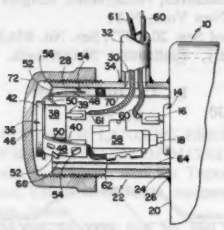
rotation of said shaft for moving said switch actuator member from its first to its second position upon the motor attaining said predetermined operating speed and for returning said switch actuator member from its second to its first position upon slowing of the motor, and means for biasing said centrifugal means toward its first position, wherein the improvement comprises; means for mounting said main body member on said shaft in substantially fixed relation with respect to said motor starting switch, and means for rotatably coupling said main body to said shaft and for permitting axial movement of said shaft relative to said main body whereby the shaft may move axially relative to said main body member without affecting operation of said motor starting switch.

4,205,246

EXPLOSION RESISTANT OVERLOAD AND RELAY MOUNTING FOR EXPLOSION RESISTANT MOTOR

Kennard L. Wise, Tecumseh, and George H. Schroeder, Clinton, Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Mar. 17, 1978, Ser. No. 887,618
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 C **11 Claims**



1. In combination with an explosion-resistant motor having a metal casing with a cluster of electrical terminals extending from a wall thereof and sealed thereto: a metal tubular member having an open inner end attached to said wall by an integral connection, said tubular member extending outwardly from said wall to an open outer end, said inner end of said tubular member surrounding said terminal cluster in spaced relationship therewith; an inherent thermal overload device having terminals; means for mounting said device in said tubular member in heat transfer relation therewith whereby said device responds to excessive casing temperature; means in said tubular member for electrically coupling one of said motor terminals to one of said device terminals; electrical leads respectively connected to another motor terminal and another device terminal and having portions extending outwardly through an opening in the side wall of said tubular member; means sealingly connected to said side wall around said opening for enclosing said lead protions, and means for removably and sealingly closing said open end of said tubular member thereby to complete an explosion resistant enclosure for said overload device.

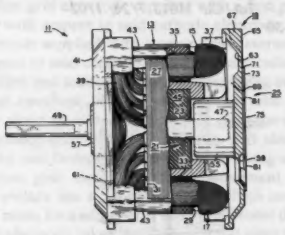
4,205,247

PRIME MOVER AND METHODS

Allen A. Brammerlo, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 15, 1978, Ser. No. 886,874
Int. Cl.[2] H02K *1/12*
U.S. Cl. 310—256 **32 Claims**

1. In a prime mover adapted to be operated in an environment in which foreign ferrous material objects may be present, the prime mover having a stator, a pair of opposite end faces on the stator, a bore in the stator and intersecting with the opposite end faces, at least one pair of opposite pole winding means associated with the stator for creating a magnetic field upon the excitation of the at least one winding means pair, the at least one winding means pair having at least one grouping of end turns with the at least one grouping of end turns being disposed adjacent one of the opposite end faces so as to extend therebeyond, at least one non-ferrous material end plate disposed on the prime mover and spaced from the one opposite end face so as to be adjacent the at least one grouping of end turns, a rotatable shaft having a section rotatably received in the at least one end plate, a rotor mounted to the shaft so as to be conjointly rotatable therewith and disposed at least in part within the bore in magnetic coupling relation with the at least one winding means pair upon the excitation thereof, at least one means in the at least one end plate for the passage therethrough of ambient air into cooling relation with the at least one grouping of end turns and at least a part of the rotor; the improvement comprising a device adapted for obviating the ingress of the foreign ferrous material objects into the prime mover into deleterious magnetic attraction engagement with the at least one grouping of end turns or the rotor upon the excitation of the at least one winding means pair to create the magnetic field, said device including a shield **25, 71** of ferrous material mounted to the at least one end plate so as to provide



generally thereacross a path for leakage flux of the magnetic field created between the at least one winding means pair upon the excitation thereof, an outer peripheral portion on said shield, another portion on said shield spaced from said outer peripheral portion so as to be disposed generally adjacent the shaft section in flux transfer relation therewith, at least another means between said outer peripheral portion and said another portion of said shield and arranged at least in part with the at least one passage means for the passage of the ambient air through the at least one passage means and said at least another passage means into the cooling relation with the at least one grouping of end turns and the at least part of the rotor, and said shield having a preselected cross-sectional area generally in the direction of said path for the leakage flux so that said shield remains unsaturated in response to the leakage flux in said path and said at least another passage means defines a null area with respect to the leakage flux in said path thereby to obviate magnetic attraction in response to the excitation of the least one winding means pair of the foreign ferrous material objects through the at least one passage means said at least another passage means into the prime mover.

4,205,248

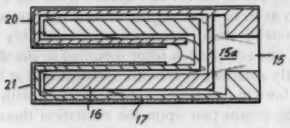
QUARTZ CRYSTAL VIBRATOR ELECTRODE CONFIGURATION

Mutsumi Negita, Minowa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,982
Claims priority, application Japan, May 31, 1976, 51-63135
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—370 **4 Claims**

1. A quartz crystal vibrator comprising a quartz crystal plate photo-etched to define a tuning fork having two vibratory tines including first and second opposed substantially planar surfaces and side surfaces between the respective opposed planar surfaces of said tines, both opposed planar surfaces of each said tine having at least two like configured electrodes

photo-etched thereon, and thin conductive film side electrodes spattered on at least the lengthwise extents of said side surfaces



of said tines for electrically coupling said respective like configured electrodes on both surfaces of said tines to each other.

4,205,249

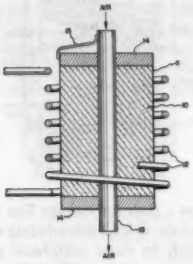
ELECTRODE STRUCTURE FOR HALOGEN LEAK DETECTOR

William D. Davis, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,091

Int. Cl.[2] H01J *7/26, 1/02*

U.S. Cl. 313—30 **7 Claims**



1. An electrode structure for a halogen leak detector comprising:

a heated anode filament composed of an oxidation-resistant metal with a melting point above approximately 1,000° C.;

a substantially cylindrical cathode envelope composed of an oxidation-resistant metal with a melting point above approximately 1,000° C., said cathode being disposed within said anode filament;

an alkali metal source compound contained within said cathode envelope; and

a hollow electrically-conductive lead disposed through the center of said cylindrical cathode envelope and being electrically connected thereto, whereby ambient air may be passed through said hollow lead to controllably cool said cathode and said alkali metal source compound contained therein.

4,205,250

ELECTRONIC TUBES

Ichiro Ohara, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

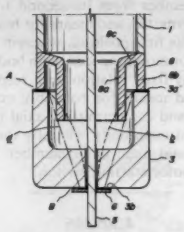
Filed Jun. 15, 1978, Ser. No. 915,743

Claims priority, application Japan, Aug. 3, 1977, 52/92526

Int. Cl.[2] H01J *1/52*

U.S. Cl. 313—242 **4 Claims**

1. In an electronic tube of the type comprising a cup shaped first electrode, a cup shaped insulator with its opening opposed the opening of said first electrode through a first joint so as to form an envelope together with said first electrode, and a second electrode secured to said insulator through a second joint, said electronic tube operating under electric field and magnetic field impressed across said first and second electrodes, the improvement which comprises a shielding member disposed between said first and second joints so as to intersect equimagnetic potential planes of the leakage flux of said mag-



netic field between said first and second joints, thereby preventing thermal fracture of said insulator.

4,205,251

X-RAY TUBE FOR THE EXAMINATION OF FINE STRUCTURES

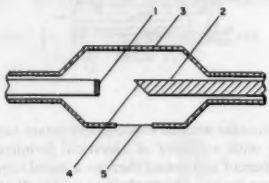
Gerrit Zwep, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,958

Claims priority, application Netherlands, Oct. 4, 1976, 7610948

Int. Cl.[2] H01J *35/08*

U.S. Cl. 313—330 **4 Claims**



1. An X-ray tube comprising an envelope, an anode and a cathode for generating an electron beam, said anode and said cathode being arranged in said envelope in spaced relationship such that said electron beam strikes a surface portion of said anode to thereby generate X-ray radiation of a predetermined wavelength range, and an additive selected from the group consisting of cobalt, chromium, iron, silver, and mixtures thereof diffused into said surface portion for increasing the heat resistance of said anode without significantly affecting the wavelength range of said X-ray radiation.

4,205,252

FLAT CATHODE RAY TUBE WITH REPELLER ELECTRODE

Clive M. Sinclair, Cambridge, and Anthony V. Krause, Huntingdon, both of England, assignors to Sinclair Radionics Limited, Cambridgeshire, England

Filed May 15, 1978, Ser. No. 906,062

Claims priority, application United Kingdom, May 18, 1977, 20962/77

Int. Cl.[2] H01J *29/72, 29/80, 29/90*

U.S. Cl. 313—422 **14 Claims**

1. A cathode ray tube, comprising

(a) an evacuated envelope including a plurality of sections (1,2) at least one of which (1) is planar and formed of a transparent material;

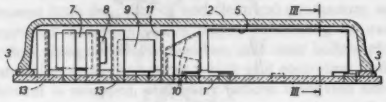
(b) a generally planar fluorescent screen (5) arranged in said envelope opposite, parallel with and spaced from said one transparent envelope section;

(c) an electron gun (7) arranged within said envelope in laterally spaced relation to said screen for projecting an

electron beam between said screen and said one transparent envelope section along a path generally parallel with the plane of said screen;

(d) first deflecting means (10) arranged in said envelope for causing the electron beam to scan a line;

(e) second deflecting means (9) arranged in said envelope for causing the electron beam to scan a frame including a



plurality of lines, thereby to produce an image on the screen; and

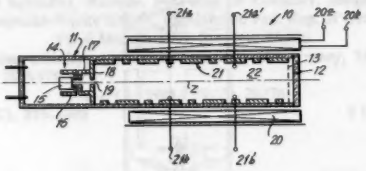
(f) beam directing means compensating for the increase of the angle of incidence of the beam at the screen relative to the direction of the electron beam, said beam directing means comprising a single electrically conductive repeller electrode (12) mounted in said envelope opposite said screen.

4,205,253

ELIMINATION OF LANDING ERRORS IN ELECTRON-OPTICAL SYSTEM OF MIXED FIELD TYPE

Takehiro Kakizaki, Yokohama; Susumu Tagawa, Atsugi, and Masahide Sawai, Ebina, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,209
Claims priority, application Japan, Feb. 25, 1977, 52-20504
Int. Cl.[2] H01J *29/74*
U.S. Cl. 313—437 **3 Claims**



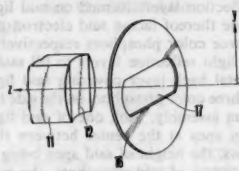
1. In an electron-optical system comprising an envelope having an axis, a target structure in said envelope extending normal to said axis, an electron gun structure in said envelope directing a beam of electrons toward said target structure and including means defining an object of the electron optical system which is spaced in the direction along said axis from said target structure, magnetic field means for generating a constant magnetic field along said axis within a cavity of said envelope between said object and said target structure, and electric field means for generating a variable electric field within said cavity orthogonal to said magnetic field and capable of causing deflection of said beam along two coordinates in a plane orthogonal to said axis so that said magnetic and electrical fields are respectively operative in said cavity to project a focused image of said object upon said target structure and to simultaneously scan said image across the surface of said target structure; said magnetic and electric fields being non-uniform in the direction along said axis, and said magnetic field means being located and dimensioned so that landing errors of said beam on said target structure due to the non-uniformity of said electric field are substantially cancelled by landing errors of the beam due to the non-uniformity of said magnetic field.

4,205,254

ELECTRON GUN FOR A CATHODE RAY TUBE

Hiromi Kanai, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 918,810
Claims priority, application Japan, Jul. 1, 1977, 52-77922
Int. Cl.[2] H01J *29/04, 29/58*
U.S. Cl. 313—454 **4 Claims**



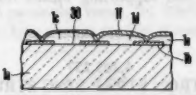
1. In an electron gun of a cathode ray tube comprising a cathode electrode having a surface for emitting an electron beam, a first grid electrode supplied with a first predetermined potential with respect to said cathode electrode, and a second grid electrode supplied with a second predetermined potential with respect to said cathode electrode, said cathode electrode and said first and second grid electrodes being contained in an evacuated envelope of said cathode ray tube and disposed coaxially along an axis of said cathode ray tube with predetermined spacing therebetween, whereby said electron beam is focused by said first grid electrode while being accelerated by said second grid electrode, the improvement wherein said cathode surface has a nonplanar form which creates different electron beam focusing effects in two different directions, said first grid electrode takes the form of a flat plate provided with an iris opening for passing said electron beam, and wherein said cathode electrode and said first grid electrode are positioned relatively such that one direction of said iris opening in which the focusing effect is strong coincides with one direction of said cathode surface in which the focusing effect is weak whereas the other direction of said iris opening in which the focusing effect is weak coincides with the other direction of said cathode surface in which the focusing effect is strong.

4,205,255

COLOR CATHODE RAY TUBE WITH REFLECTIVE LAYERS HAVING APICES CENTERED BETWEEN MATRIX WINDOWS

Yoshifumi Tomita, Mobara, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 918,839
Claims priority, application Japan, Jun. 29, 1977, 52-76509
Int. Cl.[2] H01J *29/28, 29/30, 29/32*
U.S. Cl. 313—470 **4 Claims**



1. In a black matrix type color picture tube comprising an envelope including a cylindrical neck, a funnel with its small diameter end connected to said neck, and a face plate sealed to the large diameter end of said funnel, a fluorescent screen formed on the inner surface of said face plate, said fluorescent screen including three color stripe shaped phosphors which are arranged on said fluorescent screen through light absorbing

layers, an electron gun assembly contained in said neck and including three electron guns for emitting three electron beams, and a color selection electrode disposed on the rear side of said fluorescent screen and including apertures for passing said electron beams and causing them to impinge upon said fluorescent screen so as to form a picture image, the improvement wherein said fluorescent screen comprises a plurality of spaced apart light absorbing layers respectively formed between adjacent matrix windows provided for said fluorescent screen, light reflection layers formed on said light absorbing layers on the side thereof facing said electron gun assembly, stripe shaped three color phosphors respectively formed between adjacent light reflection layers to fill said matrix windows, and a metal back layer covering said light reflection layers and said three color phosphors on the side thereof facing said electron gun assembly, each one of said light reflection layers having an apex at the center between the centers of adjacent windows, the height of said apex being substantially equal to the thickness of said phosphors, the height of each light reflection layer decreasing gradually toward the sides of said windows, and each window having a width equal to the difference between maximum electron beam diameter and one half the difference between the pitch of said windows and the width of each window.

4,205,256

MAGNETRON SUPPORTING STRUCTURE

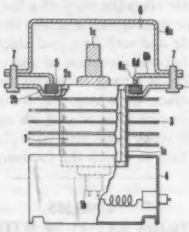
Tomokatsu Oguro, Mobara, Japan, assignor to HitachiLtd., Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 918,811

Claims priority, application Japan, Aug. 10, 1977, 52/106174[U]

Int. Cl.² H01J *25/50*

U.S. Cl. 315—39.51 **4 Claims**



1. In a magenetron device comprising a magnetron tube having an output terminal at one end thereof, a unit which is combined with the magnetron tube through a metal gasket, and supporting means connected to the periphery of said magnetron tube near said output terminal for supporting the magnetron tube, the improvement wherein said metal gasket is mounted on said supporting means such that the edge of an opening provided in said unit for receiving the output terminal is urged against said supporting means through said metal gasket.

4,205,257

MAGNETRON STRAP RING STRUCTURE

Tomokatsu Oguro, Mobara; Tatsuji Sakamoto, Inashiki, and Akio Yasukawa, Shimoinayoshi, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

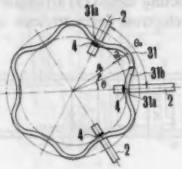
Filed Jun. 26, 1978, Ser. No. 918,812

Claims priority, application Japan, Sep. 7, 1977, 52-119359[U]

Int. Cl.² H01J *23/22*

U.S. Cl. 315—39.69 **3 Claims**

1. In a magnetron of the type comprising a cathode electrode, a cylindrical anode electrode concentrically surrounding the cathode electrode, a plurality of radial vanes secured to the inner surface of said anode electrode for defining an interaction space between the inner ends of said vanes and said cathode electrode, and concentric inner and outer strap rings which are secured to alternate vanes to short-circuit the same, the improvement wherein intermediate portions of said strap



rings between the points at which the strap rings are secured to said vanes are projected outwardly from circles passing through said securing points, and wherein each strap ring lies entirely in a plane perpendicular to the axis of the cylindrical anode.

4,205,258

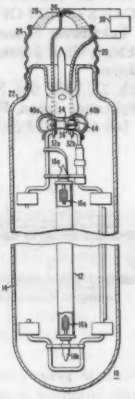
INTERNAL SHORTING FUSE FOR A HIGH-INTENSITY DISCHARGE LAMP

Patrick C. Ward, Sparta, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1979, Ser. No. 22,404

Int. Cl.² H01J *7/44*

U.S. Cl. 315—73 **6 Claims**



1. In combination with a high-intensity discharge lamp comprising an arc tube which is enclosed by and supported within a light-transmitting outer envelope which is spaced from said arc tube, said outer envelope enclosing a hard vacuum, said arc tube enclosing a discharge-sustaining filling and having electrodes operatively positioned therein proximate the ends thereof, electrical lead-in means sealed through said arc tube and connected to said electrodes, electrical adapter means affixed to the outer surface of said protective envelope to facilitate electrical connection of said lamp to a source of electrical power, a pair of electrical conductors electrically connecting said electrical adapter means to said electrical lead-in means, fuse means comprising a fusible element extending from one of said electrical conductors and separated from and encircling an insulating sleeve means carried about the other of said electrical conductors with the spacing between said fusible element and the other of said electrical conductors as determined by said insulating sleeve means constituting the shortest gap within said envelope between opposite current-

carrying components so that any arc occurring between said current-carrying components will occur proximate said insulating sleeve means and melt said insulating sleeve means and fuse said fusible element to said other electrical conductor and thus render said lamp inoperative, and the hard vacuum enclosed by said outer envelope having been obtained by flashing barium getter means, the improvement which comprises:

an improved insulating sleeve means separating said fusible element from the other of said electrical conductors, said improved insulating sleeve means comprising an outer hollow elongated sleeve member, said outer hollow elongated sleeve member about which said encircling fusible element is wrapped, said outer hollow elongated sleeve member having insulating spacing means integral therewith and projecting inwardly from the inner surface thereof and positioned a predetermined distance inwardly from the ends of said outer sleeve member, said insulating spacing means provided with a bore to receive and encircle said other electrical conductor in electrically insulative relationship to prevent said outer hollow elongated sleeve member from contacting said other electrical conductor, whereby barium flashed during gettering that may be adhered to the surface of said outer sleeve member is prevented from causing an electrical short of said arc tube.

4,205,259
HORIZONTAL DEFLECTION CIRCUIT FOR TELEVISION SYSTEMS

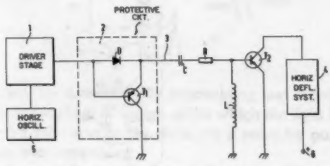
Bernd Schindler, Rastede, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Mar. 1, 1979, Ser. No. 16,386

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809378

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—408 **9 Claims**



1. Horizontal deflection circuit for a television system having an output transistor (T_2);

a driver stage (1) connected to the base of the output transistor (T_2) to alternately control the transistor to conduction and blocking state;

means (L) providing a high-voltage pulse of reverse polarity to the base of the output transistor (T_2) to cause rapid change-over from conduction to blocking state thereof, and drain stored charge carriers,

and comprising, in accordance with the invention,

a protective circuit (2) to protect the driver stage against the reverse high-voltage pulse including

controlled switch means (T_1) controlled by the driver stage (1) and preventing application of said reverse polarity high-voltage pulse to the driver stage.

4,205,260
MOTOR CONTROL SYSTEM

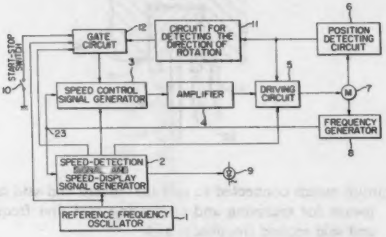
Toshinobu Maeda, Kawanishi; Yoshikazu Nakamura, Yamatokoriyama, and Akio Kawazoe, Kanagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Oki Electric Industry Co., Ltd., Tokyo, both of, Japan

Filed Jun. 28, 1978, Ser. No. 919,973

Claims priority, application Japan, Jun. 30, 1977, 52/78756; Jun. 30, 1977, 52/78757

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—318 **5 Claims**



1. A motor speed control system, comprising:

an electric motor,

a driving means for providing a drive signal to said motor to selectively generate acceleration and deceleration torques therein;

a frequency generator coupled to said motor for generating speed indicating pulses having a frequency corresponding to the motor speed;

a clock pulse generator for generating clock pulses at a fixed frequency substantially greater than the particular frequency of said speed indicating pulses corresponding to a desired speed of said motor;

a synchronizing circuit for selectively delaying each of said speed indicating pulses to synchronize the same with said clock pulses,

a frequency divider coupled to said clock pulse generator for providing reference pulses having said particular frequency and synchronous with said selectively delayed speed indicating pulses;

a multistage counter having a pulse count input terminal, a reset terminal and a plurality of output terminals;

means for applying said reference pulses to said input terminal and said selectively delayed speed indicating pulses to said reset terminal of said counter;

decoding means coupled to the output terminals of said counter for (i) generating a motor control signal for controlling the operation of said driving means to drive said motor at said particular speed, (ii) generating a display signal for indicating when said motor is at said particular speed, and (iii) generating a warning signal when the counter output appears to correspond to a motor speed in excess of said particular speed, for starting said motor or reducing a braking torque applied thereto.

4,205,261
ULTRACENTRIFUGE OVERSPEED DISK DETECTION SYSTEM

Robert C. Franklin, Los Gatos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 13, 1978, Ser. No. 924,270

Int. Cl.[2] H02P *5/06*

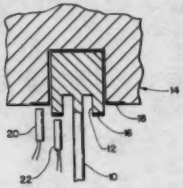
U.S. Cl. 318—480 **14 Claims**

1. An apparatus for determining the absence of an overspeed indicator in a centrifuge system having a centrifuge speed indicator, having a plurality of light reflective segments, coupled to a centrifuge drive assembly and a rotor speed indicator,

having a greater number of light reflective segments than the speed indicator, coupled to a rotor, said apparatus comprising:

a first means associated with the centrifuge speed indicator for detecting the speed of the centrifuge and producing a signal having a first frequency proportionate thereto;

a second means associated with the rotor speed indicator for detecting the speed of the rotor and producing a signal having a second frequency proportionate thereto;



circuit means connected to said first means and said second means for receiving and comparing said first frequency and said second frequency; and

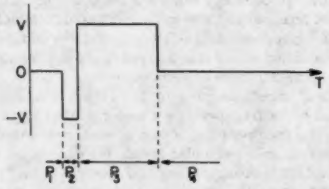
switch means connected to said circuit means for disabling operation of the centrifuge when said first frequency exceeds said second frequency.

4,205,262

ELECTRONIC WATCH

Masaharu Shida, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 7, 1977, Ser. No. 858,440
Claims priority, application Japan, Dec. 7, 1976, 51-146939
Int. Cl.[2] H02P 1/22
U.S. Cl. 318—696 **7 Claims**



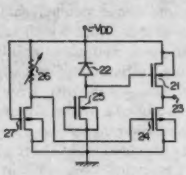
1. In a step motor and driving circuit for an electronic watch: a rotor having at least two poles, a stator composed of material of high magnetic transmission factor magnetically engaging with the rotor, means composed of a coil magnetically connected to the stator for driving the rotor in response to electrical signals applied thereto, means for positioning the rotor in advance in order to determine a direction of rotation of the rotor, wherein said rotor is normally rotated in a predetermined direction in response to a sequence of alternate polarity driving pulses applied to said coil, and means for applying a narrow pulse narrower than the driving pulses and immediately preceeding a driving pulse to said coil for reversing the direction of rotation of said rotor so that said rotor is driven in the reverse direction by the sequence of alternate polarity driving pulses.

4,205,263

TEMPERATURE COMPENSATED CONSTANT CURRENT MOS FIELD EFFECTIVE TRANSISTOR CIRCUIT

Kenji Kawagai, and Shigeki Yoshida, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Aug. 2, 1977, Ser. No. 821,198
Claims priority, application Japan, Aug. 3, 1976, 51-92452
Int. Cl.[2] G05F 3/08
U.S. Cl. 323—22 R **6 Claims**



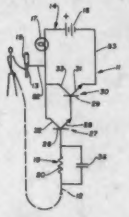
1. A MOS field effect transistor circuit comprising a first and a second power terminal, a MOS field effect transistor, a unidirectional circuit element coupled in the forward direction between the gate of said MOS field effect transistor and said first power terminal, a high-resistance element coupled between the junction of said unidirectional circuit element and the gate of said MOS field effect transistor and said second power terminal; said MOS field effect transistor circuit further comprising a voltage-dividing circuit coupled between said first and second power terminals, and a switching element coupled between said MOS field effect transistor and said second power terminal, said switching element being controlled by a voltage divided by said voltage-dividing circuit.

4,205,264

HIGH IMPEDANCE ELECTRICAL TESTING INSTRUMENT FOR AC AND DC VOLTAGE DETECTION AND CONTINUITY TESTING

Charles Gold, 8840 NW. 16th St., Plantation, Fla. 33322

Filed Apr. 25, 1978, Ser. No. 899,794
Int. Cl.[2] G01R 31/02, 19/16, 1/06
U.S. Cl. 324—51 **1 Claim**



1. An electric testing instrument comprising:

a housing having a wall of electrically conductive material adapted for manual engagement by the user and forming an input terminal for completion of an input circuit through the body of the user;

an amplifier mounted in said housing and having its input connected to an input circuit comprising a probe providing a second input terminal adapted for engagement with an electric signal, said amplifier having an output circuit comprising in series a collector, an emitter, a battery and a current responsive indicator;

said housing wall being connected to the side of said battery connected to said collector and having polarity opposite said emitter;

said indicator providing a manually discernible signal at and

above an operating current flow in said output circuit, said amplifier having a gain sufficient to provide said operating current flow in said output circuit when said input circuit is biased with an input current;

said input circuit providing said input current derives solely from said battery when said input terminals are connected across a resistance from zero ohms to as high as at least one megohm;

an electrically nonconductive material covering a portion of said housing wall;

said amplifier having a sufficient gain to provide said operating output current flow when said probe is connected to a conventional live power line providing approximately 110 volts a.c. and said nonconductive material is manually engaged by the user; and

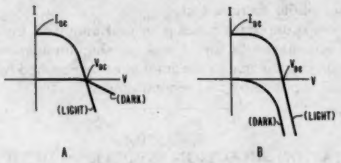
said material covering a part only of said wall leaving an uncovered portion for direct manual engagement by the user for through the body continuity testing and for detecting the presence of d.c. voltage, thereby enabling the user to distinguish between a.c. and d.c. signals.

4,205,265

LASER BEAM APPARATUS AND METHOD FOR ANALYZING SOLAR CELLS

David L. Staebler, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,302
Int. Cl.[2] G01R 27/14
U.S. Cl. 324—158 D **15 Claims**



1. An apparatus for automatically determining and recording the open circuit voltage of a solar cell in which the light IV curve crosses the IV curve in the dark, on a point by point basis, said apparatus comprising:

a light source means for producing a pulse beam of light;

means for scanning said pulsed beam of light over at least a portion of said solar cell;

lock-in amplifier means responsive to the output of said solar cell and the timing of said pulsed beam of light for providing an output signal representative of the output from said illuminated portion of said solar cell;

drive amplifier means responsive to the output of said lock-in amplifier means for applying a bias voltage to a solar cell being tested, said bias voltage being one which is near enough to the open circuit voltage of that portion of the solar cell on which said pulsed beam of light is focussed so that that portion of the solar cell is operating at a quasi open circuit voltage bias level; and

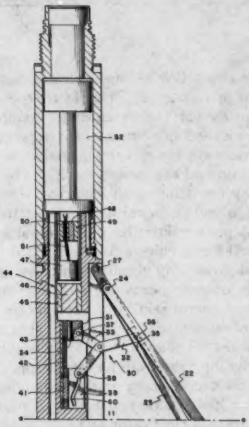
recording means for recording the quasi open circuit voltage value for at least some of said selected portions of said solar cell.

4,205,266

METHOD AND APPARATUS TO DETERMINE THE PROXIMITY OF A PERMANENT MAGNET USING A MAGNETOMETER

Heinz D. Lichtenberg, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 787,199, Apr. 13, 1977, abandoned.
This application Nov. 13, 1978, Ser. No. 960,679
Int. Cl.[2] G01R 33/02
U.S. Cl. 324—253 **4 Claims**



1. A magnetic flux sensor apparatus, for generating a signal functionally related to the distance said sensor apparatus is located from a magnet comprising:

a non-magnetic metallic housing;

a sensing coil wound coaxially around the outer circumference of a tubular bobbin formed from a non-magnetic metallic material;

said coil wound bobbin positioned inside said non-magnetic metallic housing and arranged to generate a first electrical signal in response to external magnetic flux impinging said coil from outside said housing;

a drive coil wound on a doughnut shaped toroidal core, having a square loop characteristic, said drive coil and doughnut shaped core positioned completely inside said tubular bobbin;

a magnetic window, formed by a non-magnetic sleeve surrounding a magnetically permeable material and located between said magnetic flux sensor and said magnet;

a biasing magnet positioned in a predetermined spaced relation to said housing;

voltage means connected to said drive coil for impressing a square wave voltage across said drive coil, said impressed voltage operative to drive said drive core to saturation for preventing said external magnetic flux from impinging said sensing coil; and

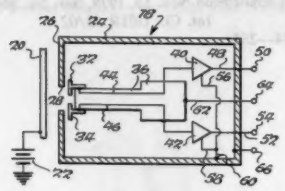
a signal transmitter system connected to said sensing coil for receiving said generated first electrical signal and transmitting a second electrical signal relating thereto.

4,205,267

HIGH SPEED ELECTROSTATIC VOLTMETER

Bruce T. Williams, 86 Park Lane Cir., Lockport, N.Y. 14094

Filed Nov. 3, 1977, Ser. No. 848,345
Int. Cl.[2] G01R 5/28, 29/12
U.S. Cl. 324—458 23 Claims



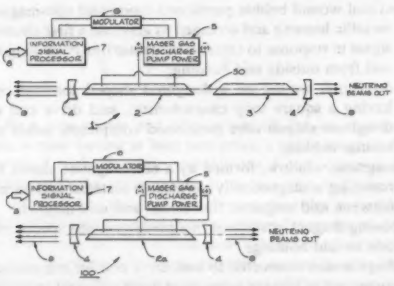
1. A non-contacting voltage follower comprising:
(a) a pair of voltage sensitive electrodes;
(b) means for varying the capacitive coupling between said electrodes and an electrical field or potential to which said electrodes are exposed and in an inverse manner to induce signals on said electrodes;
(c) means for defining an electrical reference surface exposed to said electrical field or potential;
(d) an output amplifier having an input and an output and connected as a voltage follower;
(e) signal processing circuit means having a pair of inputs and an output, means for coupling one of said circuit inputs to one of said electrodes, means for coupling the other of said circuit inputs to the other of said electrodes, and means for coupling said circuit output to said output amplifier input, said circuit means applying to said amplifier signals containing static and dynamic data of the electrical field or potential derived from said signals induced on said electrodes; and
(f) means for coupling the output of said amplifier to said electrical reference surface;
(g) whereby said amplifier output follows the static and dynamic characteristics of the electrical field or potential.

4,205,268

NEUTRINO COMMUNICATION ARRANGEMENT

Jozef W. Eerkens, 1342 Lachman La., Pacific Palisades, Calif. 90272

Filed Jan. 31, 1977, Ser. No. 764,292
Int. Cl.[2] H04B 1/00
U.S. Cl. 455—620 56 Claims



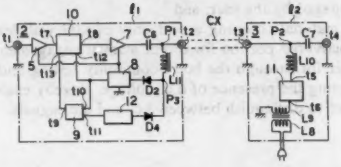
1. In a communication system, the improvement comprising:
a first emitter means for generating a first coherent neutrino-antineutrino beam in a first direction; and
a first receiver means aligned with said first emitter means and in neutrino-antineutrino beam receiving relationship therewith for receiving said first coherent neutrino-antineutrino beam and generating a first detectable output signal in response thereto.

4,205,269

REMOTE CONTROL VARIABLE ATTENUATION DEVICE FOR AN ANTENNA AMPLIFIER

Masakatsu Watanabe, Akatsukashinmachi, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Jun. 7, 1978, Ser. No. 913,269
Claims priority, application Japan, Jun. 9, 1977, 52-75100
Int. Cl.[2] H04N 7/16
U.S. Cl. 455—4 7 Claims



1. A remote control device for a variable attenuation circuit in an amplifier which is inserted in a signal transmission line in the vicinity of a television community receiving system antenna and is energized through said signal transmission line by a power supply unit in a subscriber's house, comprising:
a first diode in said power supply unit for supplying a first half cycle of an A.C. power supply signal to said amplifier;
a second diode in said power supply unit for supplying the second half cycle of said A.C. power supply signal to said amplifier;
a variable resistor in the power supply unit for varying the amount of said second half cycle signal supplied by said second diode;
a DC power supply section in said amplifier which receives the first half cycle signal from said first diode and supplies said first half cycle signal as an amplifier power signal to an amplifier section; and
an attenuation control means in said amplifier for varying the attenuation factor of said variable attenuation circuit in correspondence to the amount of said second half cycle signal supplied by said second diode.

4,205,270

STATION SELECTION INDICATING DEVICE

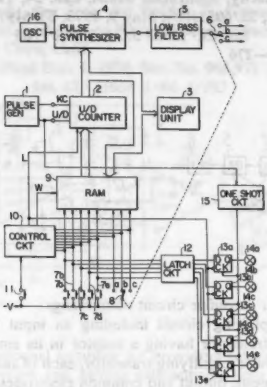
Masanao Okatani; Hiroshi Onishi; Yoshiaki Ishibashi; Reisuke Sato; Hisashi Suganuma; Tomohisa Yokogawa; Yoshiharu Ueki; Haruo Kama; Tadashi Kosuga, all of Kawagoe, and Tadashi Ogawa, Tokorozawa, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 921,154
Claims priority, application Japan, Jun. 30, 1977, 52-78081
Int. Cl.[2] H04B 1/16
U.S. Cl. 455—158 3 Claims

1. A multiband radio receiver with an electronic preset tuning system having an up-down counter, a read-write memory which is addressed by the output signals from a band select switch and channel select switches to store the count output of said up-down counter and to deliver read-out information to said up-down counter in response to write and load signals, respectively, and a control section for providing said write and load signals in response to the outputs of a preset switch and said channel select switches and band select switch, the improvement characterized in that said multiband radio receiver further includes a display section for indicating the most recently energized channel select switch, said display section comprising:
a latch circuit having a plurality of input terminals and a plurality of corresponding output terminals, said latch

circuit receiving output signals from said channel select switches as its inputs and providing a latch output signal on the output terminal corresponding to the most recently energized channel select switch; and

a plurality of indicating elements disposed adjacent said



channel select switches and connected to said latch output terminals, said indicating elements being energized by the output signal from said latch circuit and said load signal so that the indicating element adjacent the most recently energized channel select switch is energized and remains energized even when the band select switch is switched.

4,205,271

CONTROL DEVICE OF ELECTRONIC PRESET TYPE TUNER FOR MULTI-BAND RADIO RECEIVER

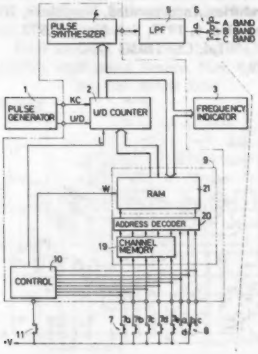
Tadashi Ogawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 911,850

Claims priority, application Japan, Jun. 3, 1977, 52/66069; Jun. 9, 1977, 52/68305; Jun. 10, 1977, 52/68495

Int. Cl.[2] H04B 1/16

U.S. Cl. 455—186 **4 Claims**



1. In an electronic preset type tuning device for a multi-band radio receiver having a plurality of tuning circuits which tuning device includes a preset switch, a pulse generator capable of generating clock pulses and up or down count pulses, a first band selector switch, a second band selector switch ganged with said first band selector switch and connected to said tuning circuits, a plurality of channel selector switches, a random access memory addressed by outputs from said first band selector switch and said channel selector switches, an up/-down counter responsive to the up or down count pulses for counting up or down the clock pulses, a digital-to-analog converter responsive to an output of said up/down counter for converting said up/down counter output into an analog signal to be fed through said second band selector switch to the tuning circuits, said counter being responsive to a load signal for receiving output data from said random access memory and supplying said data to said converter, said random access memory being responsive to a write signal for storing an output from said counter, said tuning device further characterized by a control circuit comprising:

a band selector detector having inputs connected to said first band selector switch for detecting a selected frequency band;

a first load signal generator connected to said band selection detector and in response thereto for generating a load signal to be supplied to said up/down counter; and

a controller connected to said preset switch and said channel selector switches for providing a load signal in response to an output from any one of said channel selector switches and providing a write signal to said radom access memory in response to outputs from said preset switch and any one of said channel selector switches.

4,205,272

PHASE-LOCKED LOOP CIRCUIT FOR USE IN SYNTHESIZER TUNER AND SYNTHESIZER TUNER INCORPORATING SAME

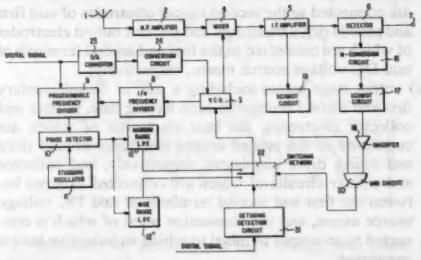
Morio Kumagai, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 896,148

Claims priority, application Japan, Apr. 13, 1977, 52-41489; Apr. 13, 1977, 52-41490; Apr. 13, 1977, 52-41491; Apr. 13, 1977, 52-41492; Apr. 13, 1977, 52-41493

Int. Cl.[2] H04B 1/06

U.S. Cl. 455—83 **24 Claims**



1. In a synthesizer tuner having a phase-locked loop circuit for a voltage controlled local oscillator where the frequency of the local oscillator output signal is divided by a programmable frequency divider and then compared with a standard frequency signal source by a phase detector, the phase detector output being applied to a low-pass filter means to derive a first DC control signal having a ripple component for controlling the frequency of the voltage controlled local oscillator, the improvement comprising

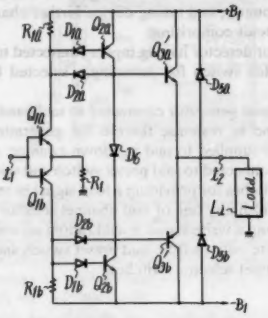
control means for producing a second DC control signal for further controlling the phase of the said local oscillator output signal so that the phase difference between the signals compared by said phase detector is reduced, said ripple component is lessened and the S/N ratio of the tuner is improved.

4,205,273

PULSE SIGNAL AMPLIFIER

Tadao Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1979, Ser. No. 6,763
Claims priority, application Japan, Jan. 30, 1978, 53-9138
Int. Cl.[2] H03F 3/18, 3/30
U.S. Cl. 330—251 10 Claims



1. A pulse signal amplifier comprising:

(a) DC voltage source means having a pair of first and second terminals;

(b) pulse signal source means for supplying a pulse signal to be amplified;

(c) pre-drive means including a pair of complementary first and second drive transistors each having control, first and second output electrodes, the control electrodes of which are supplied with the pulse signal from said pulse signal source means, the first output electrodes of which are connected to each other and to a reference point, and the second output electrodes of which are connected to the first and second terminals of said DC voltage source means through first and second loads, respectively;

(d) drive means including a pair of complementary third and fourth drive transistors each having control, first and second output electrodes, the control electrodes of which are connected to the second output electrodes of said first and second drive transistors and the first output electrodes of which are connected to the first and second terminals of said DC voltage source means, respectively;

(e) output stage means including a pair of complementary first and second transistors each having base, emitter and collector electrodes, the base electrodes of which are connected to the second output electrodes of said third and fourth drive transistors, respectively, and collector and emitter circuits of which are connected in series between the first and second terminals of said DC voltage source means, and the connection point of which is connected to an output terminal to which an inductive load is connected;

(f) first and second diode means connected between the collector and emitter electrodes of said first and second output transistors, respectively, through the first diode means of which flows a first bypass current from said inductive load during the first quarter-period of the pulse signal from said pulse signal source means and through the second diode means of which flows a second bypass current from said inductive load during the third quarter-period of said pulse signal source means; and

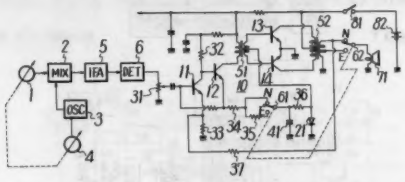
(g) current limiting means connected between the second output electrodes of said third and fourth drive transistors such that said first and second bypass currents are prevented from flowing through the base-emitter circuit of said second and first output transistors, respectively, into the second output electrodes of said third and fourth drive transistors.

4,205,274

POWER AMPLIFIER CIRCUIT

Keizo Tsukada, Kawaguchi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 29, 1979, Ser. No. 7,219
Claims priority, application Japan, Jan. 24, 1978, 53/6530; May 4, 1978, 53/60511[U]; May 9, 1978, 53/61978[U]
Int. Cl.[2] H03F 3/26; H04B 1/06
U.S. Cl. 330—276 11 Claims



1. A power amplifier circuit comprising:

(a) an amplifying circuit including an input transistor, a driving transistor having a resistor in its emitter circuit, and a power amplifying transistor, each of said transistors having input, output and common electrodes;

(b) a loudspeaker;

(c) an output transformer provided between said power amplifying transistor and said loudspeaker;

(d) a first adjusting means connected to said output transformer for adjusting the output impedance of said output transformer;

(e) a second adjusting means for adjusting the value of said emitter resistor of said driving transistor, said second adjusting means being interlocked with said first adjusting means; and

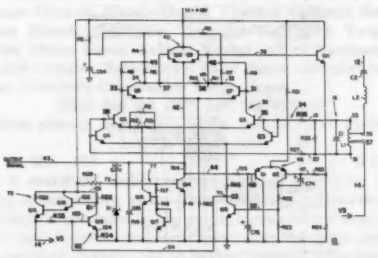
(f) a biasing means connected to said emitter resistor of said driving transistor and for producing a biasing voltage for said power amplifying transistor.

4,205,275

METHOD AND APPARATUS OF CONTROLLING BIAS VOLTAGE IN REGULATING AMPLIFIERS

Tom L. Blackburn, San Jose, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Dec. 4, 1978, Ser. No. 965,973
Int. Cl.[2] H03G 3/30
U.S. Cl. 330—279 17 Claims



6. In a regulating amplifier circuit including electron control means driven by a bias voltage and being susceptible, as the level of current passed thereby increases in response to a control signal for regulating the circuit gain, to operation in a saturation region that limits the range of input signal levels over which it operates to provide the desired regulation, the method of extending the range of input signal level over which the desired regulation is maintained comprising the step of increasing the bias voltage as the current passed by the control

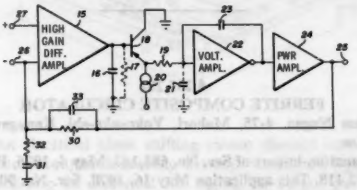
means increases to hold the latter operating out of the saturation region over a range of input signal levels.

4,205,276

AUDIO AMPLIFIER WITH LOW AM RADIATION

John W. Wright, San Jose, and William H. Gross, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 4, 1978, Ser. No. 965,971
Int. Cl.[2] H03F 1/34, 3/183
U.S. Cl. 330—294 **6 Claims**



1. An operational amplifier for providing substantial gain at audio frequencies and having substantially zero gain at frequencies within the AM standard broadcast band, said amplifier comprising:

gain producing amplifier means having substantial intrinsic gain at audio frequencies and at frequencies well in excess of said AM band;

means coupled within said amplifier to produce a declining gain versus frequency curve that falls to substantially zero at a frequency at the low frequency end of said AM band and wherein said curve has a slope in excess of 6 db per octave; and

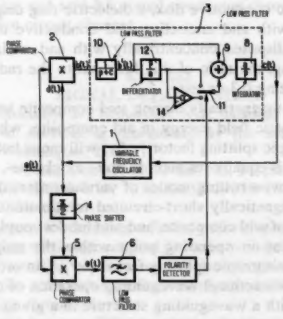
feedback means for further reducing the gain of said amplifier at frequencies above said audio frequencies and below said AM band whereby said amplifier is capable of high fidelity amplification, is stable within its passband, and produces very little energy within said AM band.

4,205,277

PHASE LOCKED LOOP WITH SWITCHABLE FILTER

Christian Poinas, Boulogne, France, assignor to Societe Anonyme Dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 26, 1978, Ser. No. 954,803
Claims priority, application France, Nov. 4, 1977, 77 33248
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—12 **8 Claims**



1. A phase-locked loop including: a voltage-controlled variable-frequency oscillator, a first cosine characteristic phase comparator having inputs receiving a reference oscillation and an oscillation supplied by the oscillator, a first low-pass filter connected between the output of the phase comparator and a frequency control input of the oscillator, said low-pass filter being provided with a switchable structure for selecting one of two possible configurations, a second cosine characteristic phase comparator having inputs receiving the reference oscillation and the oscillation which comes from the oscillator, a phase shifter for delaying one of said oscillations by $\pi/2$ radians before being applied to said second phase comparator, a second low-pass filter connected to the output of the second phase comparator, a polarity detector connected to the output of said second low-pass filter, and a changeover switch controlled by the polarity detector included in the first low-pass filter for switching between the two possible configurations thereof, and wherein in a first configuration, the first low-pass filter has a transfer function of the form:

$$F_1(p) = \frac{a+p}{p} \cdot \frac{1}{p+c}$$

with a and c as real and positive constants and p as the complex variable of the Laplace transform, and in a second configuration, said filter has a transfer function of the form:

$$F_2(p) = \frac{a-\alpha p}{p} \cdot \frac{1}{p+c}$$

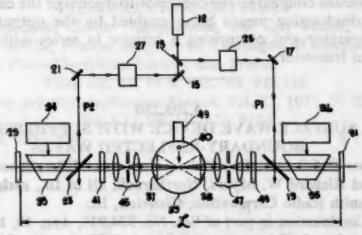
with α as a real and positive non-zero constant.

4,205,278

MULTIPLE EXCITATION REGENERATIVE AMPLIFIER INERTIAL CONFINEMENT SYSTEM

Victor E. George, Livermore; Roger A. Haas; William F. Krupke, both of Pleasanton, and Leland G. Schlitt, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 11, 1978, Ser. No. 868,639
Int. Cl.[2] H01S 3/091
U.S. Cl. 331—94.5 P **11 Claims**



1. Apparatus for producing a high energy laser pulse, the apparatus comprising:

a large aperture light amplifier containing a regenerative medium;

an optical cavity including at least two light reflective means containing the amplifier therebetween;

laser means for producing a laser pulse to be amplified;

pulse injection means for introducing the laser pulse between two light reflective means of the optical cavity so as to permit the laser pulse to propagate as a beam from one light reflective means to the other;

pump means for repeatedly and transistorily exciting the amplifier medium so as to amplify the laser pulse as it passes through the amplifier medium, with the amplifier medium being excited at least once for each passage of the laser pulse therethrough; and

optical switch means to controllably remove the laser pulse from the optical cavity, positioned in the path of the laser

pulse, to allow the pulse to pass through undeviated in direction when the optical switch means is in its unactivated state, and to cause the pulse to deviate in direction when the optical switch means is in its activated state.

4,205,279

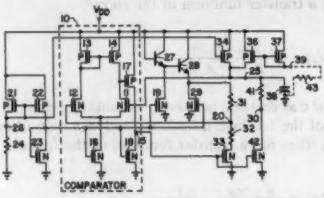
CMOS LOW CURRENT RC OSCILLATOR

Robert R. Beutler, Beaverton, Oreg., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 832,138, Sep. 12, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,905

Int. Cl.² H03K *3/353, 4/50*

U.S. Cl. 331—111 **7 Claims**



1. A low current oscillator using a differential amplifier as a comparator and having a first and a second voltage terminal, the differential amplifier having a current source, comprising: bias network for providing bias currents for the oscillator, the bias network being coupled to the comparator to establish a current through the current source; at least one substrate NPN transistor for providing a voltage drop; a pair of resistors in series with the substrate NPN transistor to provide a reference voltage for the comparator; switching means in series with the pair of resistors for completing a voltage divider circuit having the substrate NPN transistor and the pair of resistors, the switching means being enabled by an output from the comparator, and the at least one substrate NPN transistor, the pair of resistors and the switching means all being serially coupled between the first and second voltage terminals; a capacitor coupled to the comparator; a second current source coupled to the capacitor for linearly charging the capacitor; and discharging means coupled to the capacitor to discharge the capacitor, the discharging means being enabled by the output of the comparator and comprising a resistor in series with a field effect transistor.

4,205,280

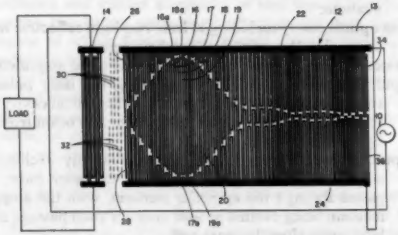
SURFACE WAVE DEVICE WITH SUPPRESSED BOUNDARY-REFLECTED WAVES

Forbes D. Gilchrist, Des Plaines; Robert L. Miller, Schaumburg, and Richard W. Myers, Northbrook, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 934,915, Aug. 18, 1978, abandoned. This application Sep. 5, 1978, Ser. No. 939,575

Int. Cl.² H03H *9/04, 9/26, 9/30, 9/32*

U.S. Cl. 333—151 **13 Claims**



1. In a surface wave transmitting device having a piezoelectric surface wave propagative medium and an interdigitated comb surface wave transducer on a surface of said medium for launching or receiving on said surface of said medium surface wave of predetermined wavelength, the improvement characterized by said transducer having at a transducer boundary or at an internal spacing irregularity in the transducer tooth pattern a first tooth on a first comb connected to its associated bus bar, and, on an opposed second comb a second tooth collinear with said first tooth but electrically isolated from its associated bus bar.

4,205,281

FERRITE COMPOSITE CIRCULATOR

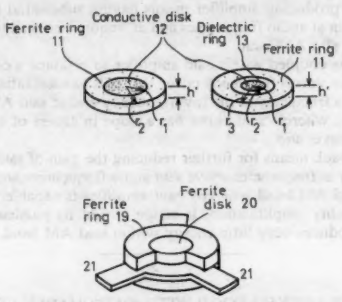
Tsukasa Nagao, 4-75, Mabori, Yokosuka-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 683,143, May 4, 1976, Pat. No. 4,122,418. This application May 16, 1978, Ser. No. 906,374

Claims priority, application Japan, May 10, 1975, 50-54922; Apr. 19, 1976, 51-44760

Int. Cl.² H01P *1/38*

U.S. Cl. 333—1.1 **3 Claims**



1. A ferrite composite circulator comprising a ferrite-dielectric-conductor composite positioned and centered in a common region having the same size as that of said composite with its axis common to aid common region between two ground planes, said composite being made of a centrally disposed non-magnetic conductive disk, a dielectric ring disposed concentrically with and encircling said conductive disk, and a ferrite ring disposed concentrically with and encircling said dielectric ring, the ratio of the thickness to the radius of said composite being 0.3 or less,

means for magnetically biasing said composite so that electromagnetic field energy in aid composite, whose ferrite anisotropic splitting factor $|\kappa/\mu|$ will range between 0.05 and 0.9, is equally resonant in non-, clockwise-, and counterclockwise-rotting modes of various orders determined by a magnetically short-circuited termination at the periphery of said composite, and said modes couple with one another at an operating point within the range of said ferrite anisotropic splitting factor $|\kappa/\mu|$, in order to produce unidirectional waveguiding operation of circulation along with a waveguiding structure in a given frequency band,

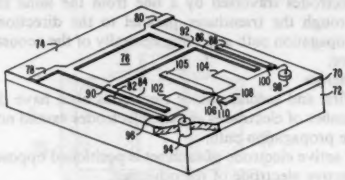
and a junction having said waveguiding structure forming at least three branches symmetrically extending away in the direction peripendicular to said axis from said common region to three respective ports.

4,205,282

PHASE SHIFTING CIRCUIT ELEMENT

John W. Gipprich, Reistertown, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1978, Ser. No. 935,284
Int. Cl.[2] H01P *3/08, 1/18, 9/00, 5/16*
U.S. Cl. 333—161 **20 Claims**



1. An electrical phase shifting circuit element including a quadrature coupler branching network having an input port for receiving an electrical RF signal, an output port from which the phase shifted RF signal may be generated and first and second phase splitting ports; and two matched reflective termination networks, one being coupled to said first phase splitting port and the other being coupled to said second phase splitting port, said each matched reflective termination network comprising:

a pair of selectably coupled transmission lines being separated distributively from each other and from a first voltage potential by a dielectric material of a predetermined dielectric constant, one of said transmission lines being electrically coupled to said phase splitting port corresponding to said reflective termination network;

an electrical switching element operative to transfer between first and second switching states as governed by a switching signal, said switching element electrically connecting the other transmission line of each said pair to a second voltage potential when operated in said first switching state and electrically disconnecting said other transmission line from said second voltage potential when operated in said second switching state, said connecting and disconnecting of said other transmission line from said second voltage potential rendering a phase shift of said RF signal at the output of said quadrature coupler branching network, the magnitude and direction of said rendered phase shift being a function of the selected coupling of said pair of transmission lines; and

a filtering circuit for providing mutual electrical decoupling between said switching signal governing the switching element and said RF signal conducted through the phase shifting circuit element.

4,205,283

SIGNAL DELAY SYSTEM

William Donnally, Jr., Mine Hill, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 10, 1978, Ser. No. 949,586
Int. Cl.[2] H03H *7/28, 7/30;* **H03K** *5/159;* **G11C** *19/28*
U.S. Cl. 333—165 **5 Claims**

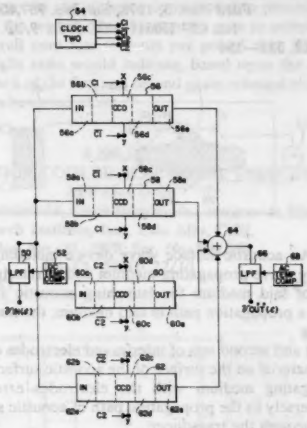
1. A system for delaying a first signal comprising:

a plurality of charge coupled devices, each being responsive to controlling clock pulses, for sampling said first signal;

a summer responsive to the output signals of each of said charge coupled devices;

an output low pass filter responsive to the output signal of said summer for reconstructing said summer output signal into a second signal which is substantially a delayed version of said first signal; and includes said output low pass filter which is temperature compensated to substantially neutralize the effect of temperature variations on the AC gain of said charge coupled devices; and

a clock pulse generator having a plurality of outputs connected to the clock inputs of said plurality of charge



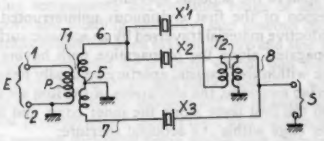
coupled devices whereby each of said charge coupled devices are caused to regularly sample said first signal at sampling times different from and interleaved with the sampling times of each of the other charge coupled devices.

4,205,284

ELECTRICAL FREQUENCY FILTER COMPRISING PIEZOELECTRIC CRYSTALS

Paul Bouchou; Claude Nigoghossian, and Guy Sillioc, all of Sartrouville, France, assignors to Compagnie D'Electronique et de Piezo-Electricite, Sartrouville, France

Filed Jul. 19, 1978, Ser. No. 926,115
Claims priority, application France, Jul. 22, 1977, 77 22566
Int. Cl.[2] H03H *9/26, 9/32*
U.S. Cl. 333—189 **8 Claims**



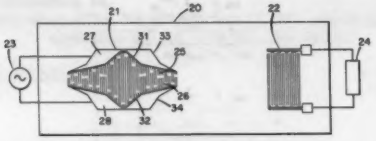
1. An electrical frequency filter comprising two input terminals (1) (2) and two output terminals (3) (4) for respectively introducing and extracting an electrical a.c. voltage having a frequency within respective given bands, the input terminals feeding an input winding of a differential transformer (T_1) of which two output windings coupled to said input winding have a common terminal (5) kept at a fixed potential, their two other seperate terminals being connected along two arms (6) (7) to two pluralities of piezoelectric crystals (X'_1) (X_2) (X_3), the two arms being connected by connecting means (8) to the two output terminals, wherein at least one of the piezoelectric crystals (X'_1) is accommodated in one of the arms by means of a transformer (T_2).

4,205,285

ACOUSTIC SURFACE WAVE DEVICE

Martin E. Dempsey, Acton, and Ching W. Lee, Lexington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 3, 1978, Ser. No. 957,400
Int. Cl.[2] H03H *9/04, 9/26, 9/32*
U.S. Cl. 333—194 **2 Claims**



1. An acoustic surface wave device including an acoustic surface wave propagating medium and a transducer on a surface of said medium for launching acoustic surface waves along a propagation path in said medium; the transducer comprising

first and second sets of interleaved electrodes of conductive material on the surface of the acoustic surface wave propagating medium with the electrodes extending transversely to the propagation path of acoustic surface waves through the transducer;

portions of electrodes of the first set overlapping portions of electrodes of the second set with the lengths of the overlapping portions varying along the direction of the propagation path;

the overlapping portions defining an overlap envelope and the maximum amount of overlap defining the acoustic aperture of the transducer lying transverse to the propagation path;

a first continuous uninterrupted layer of conductive material on the surface of the acoustic surface wave propagating medium having the electrodes of the first set extending therefrom, said first continuous uninterrupted layer lying outside the overlap envelope and extending within the acoustic aperture; and

a second continuous uninterrupted layer of conductive material on the surface of the acoustic surface wave propagating medium having the electrodes of the second set extending therefrom, said second continuous uninterrupted layer lying outside the overlap envelope and extending within the acoustic aperture;

the total width of conductive material traversed by an acoustic surface wave propagated along the propagation path through the transducer being substantially the same over the span of the acoustic aperture;

the region of the first continuous uninterrupted layer of conductive material traversed by an acoustic surface wave propagated along the propagation path having an inner edge within the acoustic aperture generally following the overlap envelope, the electrodes of the first set extending from the first layer along the inner edge, and having an outer edge within the acoustic aperture;

the width of conductive material traversed by a line from the junction of each electrode of the first set with the inner edge of said region of the first layer through the transducer and parallel to the direction of the propagation path to the outer edge of said region of the first layer being substantially the same as the sum of the widths of the electrodes traversed by a line from the same electrode through the transducer parallel to the direction of the propagation path and lying centrally of the acoustic aperture;

the region of the second continuous uninterrupted layer of conductive material traversed by an acoustic surface wave propagated along the propagation path having an inner edge within the acoustic aperture generally following the overlap envelope, the electrodes of the second set extending from the second layer along the inner edge, and having an outer edge within the acoustic aperture;

the width of conductive material traversed by a line from the junction of each electrode of the second set with the inner edge of said region of the second layer through the transducer and parallel to the direction of the propagation path to the outer edge of said region of the second layer being substantially the same as the sum of the widths of the electrodes traversed by a line from the same electrode through the transducer parallel to the direction of the propagation path and lying centrally of the acoustic aperture;

and wherein

the first and second sets of electrodes each have the same number of electrodes and the electrodes extend normal to the propagation path;

each active electrode of each set is positioned opposed to an inactive electrode of the other set;

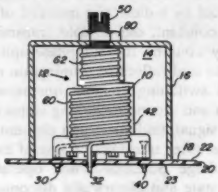
the outer edge of each region of each of said layers of conductive material lies at an acute angle to the direction of the propagation path whereby reflections from said outer edge are not propagated along the propagation path.

4,205,286

TEMPERATURE STABILIZED HELICAL RESONATOR

Edward C. Parish, Ft. Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1978, Ser. No. 881,308
Int. Cl.[2] H01P *7/00*
U.S. Cl. 333—226 **16 Claims**



1. In a resonator assembly wherein a conductive winding is supported on a coil form with the resulting assembly being positioned in a cavity and wherein a tuning element is located in circuit configuration with the winding, the improvement comprising:

said coil form having first and second sections, each section supporting a portion of the winding;

interconnecting means for mechanically interconnecting said first and second coil form sections such that the axes of the coil portions supported thereon are substantially coincident, said interconnecting means providing strain relief between the coil sections in the direction of said coincident axes; and

means for affixing the axial end portions of said coil form with respect to said resonant cavity and said tuning element thereby maintaining a fixed spatial relationship between the resonant cavity and both ends of said coil form.

4,205,287

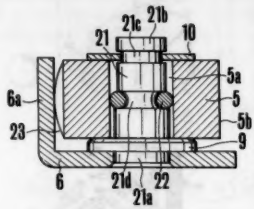
ELECTROMAGNETIC DEVICE

Masami Shimizu, Tokyo, and Teiji Hashimoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,531
Claims priority, application Japan, Aug. 11, 1977, 52/107561[U]
Int. Cl.[2] H01F *7/00*
U.S. Cl. 335—271 **5 Claims**

1. An electromagnetic device comprising: an armature adapted to be electromagnetically energized including a top face, a bottom face and means defining a hole extending contin-

uously through said armature from said top face to said bottom face; an armature lever mounted for rotative movement; a pivot axle formed with a circumferential groove on the outer periphery thereof fixedly mounted upon said armature lever and having said armature mounted thereon, said pivot axle extending through said armature hole and having an outermost diameter smaller than the diameter of said armature hole to define a gap therebetween; spring means applying to said



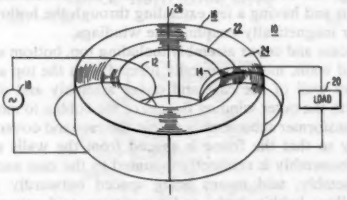
armature lever a spring biasing force in a direction counteracting the force applied thereto by electromagnetic energization of said armature, said counteracting spring biasing force being weaker than the force applied by said electromagnetic energization of said armature; and a body of resilient material secured in said gap between said pivot axle and said armature hole to resiliently support said armature relative to said armature lever.

4,205,288

TRANSFORMER WITH PARALLEL MAGNETIC CIRCUITS OF UNEQUAL MEAN LENGTHS AND LOSS CHARACTERISTICS

Kou C. Lin, Hermitage; Belvin B. Ellis, Pulaski, and Charles E. Burkhardt, Sharon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 27, 1978, Ser. No. 956,142
Int. Cl.[2] H01F *33/00, 27/24*
U.S. Cl. 336—5 **4 Claims**



1. An electrical power transformer for transmitting and distributing electrical power in an electrical power system, comprising:

a magnetic core devoid of non-magnetic gaps,

said magnetic core being constructed to provide inner and outer parallel, concentrically adjacent, magnetic circuits,

said inner and outer magnetic circuits being constructed of magnetic materials having different loss characteristics at like inductions, with the inner magnetic circuit being constructed of the material having the lower loss characteristic,

said outer magnetic circuit being constructed of a first grain oriented, regular B, electrical steel,

said inner magnetic circuit being constructed of a second grain oriented, high B, electrical steel having a higher permeability at like levels of induction, and a higher B_{10} value, than said first grain oriented electrical steel, with said second grain oriented electrical steel having a B_{10} value of at least 18.5 KG,

and first and second electrical windings each disposed to link both said inner and outer magnetic circuits, said first and second electrical windings being adapted for connection to a source of electrical potential and to a load circuit, respectively,

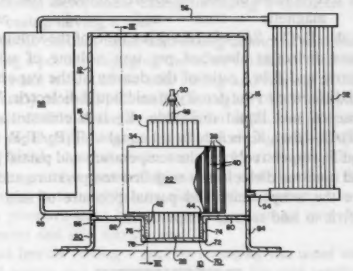
said inner magnetic circuit being constructed to provide 30 to 60% of the weight of said magnetic core to provide a lower overall core loss in watts per pound than the selected weight ratio would indicate, based upon the core losses of each of the first and second grain oriented electrical steels when used alone.

4,205,289

VAPORIZATION COOLED ELECTRICAL INDUCTIVE APPARATUS

Thomas W. Stubblefield, South Boston, Va., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Apr. 25, 1978, Ser. No. 900,040
Int. Cl.[2] H01F *27/10*
U.S. Cl. 336—57 **9 Claims**



1. Electrical inductive apparatus comprising:

an enclosure;

a magnetic core and winding assembly disposed in said enclosure including a lower yoke portion disposed beneath the winding assembly and producing heat during normal operation;

a liquid dielectric disposed in said enclosure to a predetermined level, said liquid dielectric being vaporizable within the normal operating temperature range of said magnetic core and winding assembly;

a storage reservoir disposed in fluid flow communication with said enclosure; and

a gaseous dielectric substantially non-condensable over the operating temperature and pressure range of said magnetic core and winding assembly, said gaseous dielectric being transferable between said enclosure and said storage reservoir in response to pressure within said enclosure provided by the vapors of said liquid dielectric, with said gaseous dielectric filling substantially all of said enclosure at a first predetermined temperature and substantially all of said gaseous dielectric being within said storage reservoir at a second predetermined temperature, which temperatures are within the operating temperature range of said magnetic core and winding assembly;

a portion of said gaseous dielectric being absorbed into said liquid dielectric at said first predetermined temperature and released into said enclosure at said second predetermined temperature with a resulting increase in volume of said gaseous dielectric;

said enclosure including a bottom surface having a channel portion which defines a recess having said lower yoke portion disposed therein, and which laterally surrounds the yoke portion in said recess in spaced relationship therewith, thereby reducing the free volume of said enclosure, with the space between said lower yoke portion and said channel portion forming a sump for said liquid dielec-

tric thereby reducing the volume of said liquid dielectric necessary to fill said enclosure to said predetermined level, whereby the reduction in both the free volume of said enclosure and the volume of said liquid dielectric reduces the required volume of said storage reservoir necessary to contain substantially all of said gaseous dielectric at said second predetermined temperature, wherein the reduction in the required volume of said storage reservoir is substantially greater than the total reduction of the free volume of said enclosure plus the reduction in volume of said liquid dielectric, said storage reservoir having a required volume which is proportional to the free volume of said enclosure and the volume of said liquid dielectric and is given by:

$$V_S = \frac{V_E + K_1 V_L}{K_2 K_3 - 1}$$

where V_S is the required volume of said storage reservoir, V_E is the free volume of said enclosure excluding the volume of said magnetic core and winding assembly, $K_1 = (\phi - 1)/(1 - \beta\phi)$ wherein ϕ is a ratio of the volume of said gaseous dielectric absorbed per unit volume of said liquid dielectric and β is a ratio of the density of the vapors of said liquid dielectric to the density of said liquid dielectric, V_L is the volume of said liquid dielectric, K_2 is a constant equal to $(1-\beta)/(1-\beta\phi)$, K_3 is a constant equal to T_1P_2/T_2P_1 wherein T_1 and P_1 respectively are the temperature and partial pressure of said gaseous dielectric at said first temperature and T_2 and P_2 are the temperature and partial pressure of said gaseous dielectric at said second temperature.

4,205,290

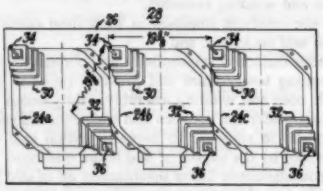
TRANSFORMER CONSTRUCTION

Robert S. Canney, Berwick, Me.; Ronald J. Ouellette, Bedford, and William H. Morong, Jr., Madbury, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Dec. 22, 1978, Ser. No. 972,505

Int. Cl.² H01F *27/04*

U.S. Cl. 336—90 **7 Claims**



1. In an electrical apparatus, the combination comprising:

(a) a generally rectangular tank;

(b) a cover mounted on said tank;

(c) a pair of high voltage bushings mounted on diagonally opposite corners of said cover, with said bushings diametrically extending outward of said tank at their respective corners at acute angles with said cover;

(d) a generally rectangular core assembly mounted inside said tank and extending transversely between the remaining diagonally disposed corners of said tank; and

(e) a coil assembly disposed on said core assembly, said coil assembly including a pair of connecting means, each in substantial alignment with a respective bushing and each connected to a conductor extending through its aligned bushing into said tank.

4,205,291

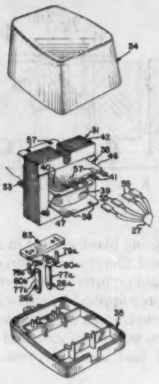
HEAVY DUTY CONVERTER

Robert W. Flentge, Roselle, Ill., assignor to A. F. Dormeyer Manufacturing Co., Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 777,081, Mar. 14, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,329

Int. Cl.² H01F *27/02, 15/10*

U.S. Cl. 336—92 **18 Claims**



1. A heavy duty converter for use with electrical devices to reduce line voltage and provide a low operating voltage, said converter comprising a case and cover assembly and a transformer subassembly within the case and cover assembly,

said transformer subassembly including a bobbin of electrical insulating material having a hollow body, first and second outer winding flanges extending perpendicularly to the axis of the hollow body, primary and secondary windings on the hollow body between the winding flanges, each of said flanges having an outer side remote from the windings and an inner side adjacent said windings and an iron frame surrounding said bobbin along one axis and having a leg extending through the hollow body for magnetically coupling the windings,

said case and cover assembly including top, bottom side and end walls, means integrally formed with the top and bottom wall of the case and cover assembly and coacting with the outer winding flanges of the bobbin to mount the transformer subassembly within the case and cover assembly so that the frame is spaced from the walls and the subassembly is resiliently mounted to the case and cover assembly, said means being spaced outwardly of said hollow bobbin body and supporting said outer flange sides, and

connector means for said windings to connect the primary winding to a voltage source and the secondary winding to an electrical device.

4,205,292

ELECTRIC TIME SWITCH

Gerhard Göessler, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geraete Blanc und Fischer, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,172

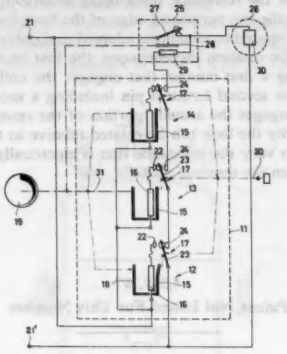
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730446

Int. Cl.² H01H *71/16, 71/22*

U.S. Cl. 337—101 **18 Claims**

1. An electric time switch mechanism comprising a plurality of units each having an operating thermal expansion member, electrical heating means for the thermal expansion member and a switch which is activated by the thermal expansion member, the units being connected in series in such a way that the

activation of a switch turns off the heating means of the associated thermal expansion member and turns on that of the following unit, the switches remaining in the activated state after activation and being resettable by external activation.



4,205,293

THERMOELECTRIC SWITCH

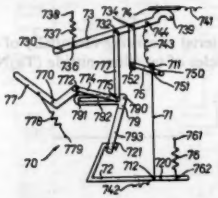
Keith N. Melton, Busslingen, and Olivier Mercier, Ennetbaden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 28, 1978, Ser. No. 900,866

Claims priority, application Switzerland, May 6, 1977, 5698/77

Int. Cl.² H01H *61/04, 61/06*

U.S. Cl. 337—140 **12 Claims**



1. A thermoelectric switch comprising:

a current conducting triggering element made from a shape memory alloy exhibiting a two way temperature effect such that a thermally controlled transformation occurs when said triggering element passes from a partly matensitic state into an at least partly austenitic state, said triggering element then contracting, and when said triggering element reverses through the said transformation, said triggering element then expanding;

at least one stressing device operatively connected with said triggering element, said stressing device exerting force on said triggering element with said force determining the switching temperature of the switch;

means for movably supporting said triggering element; and

circuit means contacting said triggering element as a result of said transformation.

4,205,294

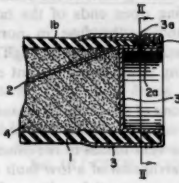
SOLDERLESS FUSE TERMINAL

Philip C. Jacobs, Jr., Newtonville, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 25, 1978, Ser. No. 945,542

Int. Cl.² H01H *85/16*

U.S. Cl. 337—234 **7 Claims**



1. In an electric fuse the combination of

(a) a tubular deformable casing including a synthetic resin, said casing having a rim;

(b) a fusible element inside said casing bent over said rim and having a portion engaging the outer surface of said casing;

(c) a ferrule mounted on said casing and having a radially inwardly directed indentation in registry with said portion of said fusible element on the outer surface of said casing, said indentation engaging and deforming said portion of said fusible element on the outer surface of said casing and exerting such a pressure against said portion of said fusible element as to establish an electrically conductive solderless pressure-joint between said portion of said fusible element and said ferrule; and

(d) said ferrule having a portion engaging the inner wall of said casing and providing a back-up for said conductive solderless pressure joint.

4,205,295

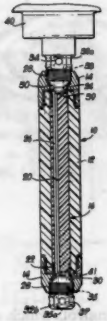
HIGH CONTINUOUS CURRENT CAPACITY OIL EXPULSION FUSE

William R. Mahieu, Rt. 4, Centralia, Mo. 65240

Continuation-in-part of Ser. No. 837,992, Sep. 29, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,250

Int. Cl.² H01H *85/14, 85/02*

U.S. Cl. 337—250 **13 Claims**



1. A high voltage distribution circuit expulsion fuse adapted for use while immersed in oil and comprising:

an elongated, non-conductive member having a number of individual, discrete bores extending therethrough, each of which is open at opposite ends thereof;

terminal means at each end of the member presenting corresponding chambers communicating with the open ends of the bores at opposite extremities of the member; and

a fusible element within each of the bores and extending along at least a part of the length thereof, each of said fusible elements being electrically connected to opposed terminal means in parallel for flow of electrical current through all of the elements when the fuse is functioning in the normal current carrying mode thereof.

each of said terminal means being provided with vent means therein communicating each of the chambers and thereby the corresponding open ends of the bores with the oil medium surrounding the fuse in normal use thereof whereby convective flow of oil through all of the bores is maintained during said normal current carrying mode of the fuse,

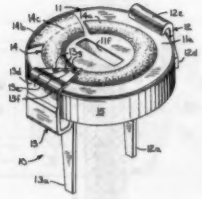
the vent means in one of the terminal means being of greater total effective vent area than the corresponding total event area of the vent means in the other terminal means so that upon interruption of a low fault or overload current which causes sequential melting of the elements to occur accompanied by suppression and extinguishment of the arc produced in the bore containing the last to melt element, restrike in any of the bores is effectively precluded when the high rate of rise recovery voltage is imposed on the fuse in that although oil-derived gases generated by arcing of the last to melt element flow through the bore containing such element into both of the chambers, such gas also flows through the other bores from the chamber in said other terminal means toward the chamber in said one terminal means by virtue of the greater resistance to outflow of gases from said other terminal means than said one terminal means.

4,205,296

RHEOSTAT TRIMMER

Sydney W. Frey, Jr., Brookfield, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 10, 1978, Ser. No. 949,526
Int. Cl.[2] H01C *10/26*
U.S. Cl. 338—150 **11 Claims**



1. A variable resistor control, which comprises:

a base having top and bottom surfaces and a peripheral side surface extending between and joined to the top and bottom surfaces to form top and bottom peripheral edges, respectively;

a resistance track disposed on the top surface of the base with an arcuate portion spaced inwardly from the top peripheral edge of the base and with a termination portion extending outwardly from the arcuate portion to the top peripheral edge of the base;

a collector track disposed on the base along its peripheral side surface, the collector track and the termination portion of the resistance track being electrically connected along the top peripheral edge of the base; and

a pair of spaced terminal pins adapted to slidably support the base for rotation therebetween, the first terminal pin including a first contact that engages the collector track, and the second terminal pin including a second contact that engages the arcuate portion of the resistance track, whereby the base can be rotated relative to the terminal pins to vary the resistance that is electrically connected between the terminal pins.

4,205,297

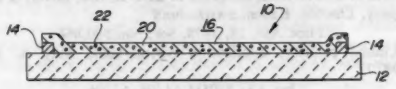
Patent Not Issued For This Number

4,205,298

RESISTOR MATERIAL, RESISTOR MADE THEREFROM AND METHOD OF MAKING THE SAME

Howard E. Shapiro, Philadelphia, and Kenneth M. Merz, Gladwyne, both of Pa., assignors to TRW, Inc., Cleveland, Ohio

Filed Nov. 20, 1978, Ser. No. 962,233
Int. Cl.[2] H01C *1/012*
U.S. Cl. 338—308 **25 Claims**



1. A resistor material consisting essentially of a mixture of a glass frit and particles of tantalum nitride (Ta_2N).

4,205,299

THIN FILM RESISTOR

Fritz Klesse, Schwestergasse 39, 8300 Landshut, Fed Rep. of Germany, and Jürgen Förster, Prinz-Ludwig-Str. 317, 8050 Freising, Fed. Rep. of Germany

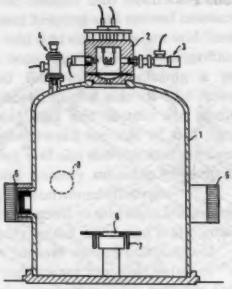
Division of Ser. No. 908,679, May 23, 1978, which is a continuation-in-part of Ser. No. 764,015, Jan. 31, 1977, abandoned. This application Dec. 29, 1978, Ser. No. 974,491
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605174
Int. Cl.[2] H01C *1/012*
U.S. Cl. 338—308 **2 Claims**

1. Thin-film resistor comprising an insulating carrier member with a resistor film deposited thereon,

the resistor film comprising 30 to 80 mole percent of a metal selected from the group consisting of chromiom and a chromiom compound, 10 to 35 mole percent nickel and 10 to 35 percent of an added amount of at least one metal

selected from the group consisting of gold, cobalt, aluminum, and tin in at least one form selected from the group consisting of metal and metal oxide,

said deposition having been carried out by reactive sputtering in the presence of a reactive gas containing oxygen, having a partial pressure of from 1×10^{6} to 1×10^{4} Torr,



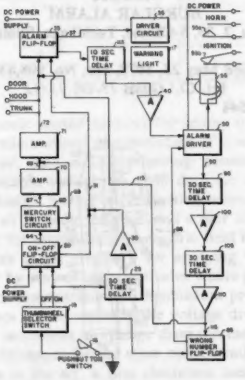
said resistor having a resistance range of between 1 Ohm to 10^{6} Ohm; electrical stress of 1 Watt to ambient temperature of 70° C.; temperature coefficient of -200×10^{-6}/°C.; change in resistance of $\leqq\pm1\%$ after 1,000 hours at 70° C. and 1 Watt of electrical stress; change in resistance of $\leqq\pm1.5\%$ after 10,000 hours at 70° C. and 1 Watt of electrical stress; change in value under the effect of moisture $\leqq\pm0.5\%$ and non-linearity (1,000 kohm)$\leqq$100 dB.

4,205,300

VEHICLE ANTITHEFT ALARM

Eugene Y. Ho, San Carlos, and Joseph A. Musolino, San Jose, both of Calif., assignors to Techne Electronics, Ltd., Redwood City, Calif.

Filed Aug. 30, 1976, Ser. No. 718,587
Int. Cl.² B60R *25/10, 25/04;* G 8B *13/08*
U.S. Cl. 340—65 **8 Claims**



3. Apparatus for inhibiting vehicle theft comprising:

(a) means operative for inhibiting vehicular theft;

(b) circuit means for controlling the operation of said theft-inhibiting means;

(c) means including a selector switch connected to said circuit means to select one code for enabling said circuit means to operate said theft-inhibiting means in response to one predetermined code setting and to select another code for disabling said circuit means to prevent said theft-inhibiting means from operating in response to another predetermined code setting; and

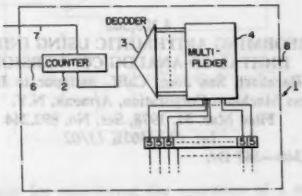
(d) wrong code means connected to said circuit means and responsive to said selector switch being actuated to a setting other than one of said predetermined codes for activating said circuit means to operate said theft-inhibiting means.

4,205,301

ERROR DETECTING SYSTEM FOR INTEGRATED CIRCUIT

Masahide Hisazawa, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed Mar. 17, 1978, Ser. No. 887,919
Claims priority, application Japan, Mar. 17, 1977, 52-29644
Int. Cl.² G06F *11/10*
U.S. Cl. 371—3 **6 Claims**



1. An integrated circuit comprising:

a plurality of cooperating functional block means for processing digital signals, each block comprising digital circuitry and being formed with redundancy means for allowing detection of malfunctions;

a plurality of error detecting circuit means, each connected to one of said functional block means, for detecting malfunctions of the corresponding functional block means;

a plurality of memory element means, each connected to one of said error detecting circuit means, for storing a predetermined value when the corresponding error detecting circuit means detects a malfunction; and

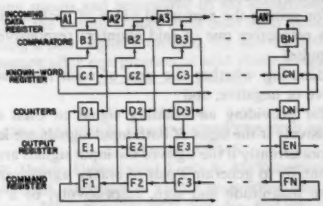
a log-out mechanism means, connected to said plurality of memory element means, for outputting the contents of said memory element means to the outside of the integrated circuit.

4,205,302

WORD RECOGNIZING SYSTEM

Einar Godo, 2407 170th Pl., SE., Bellevue, Wash. 98008

Continuation of Ser. No. 846,384, Oct. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,220, Jan. 26, 1976, abandoned. This application Nov. 29, 1978, Ser. No. 964,473
Int. Cl.² G06F *7/04*
U.S. Cl. 340—146.2 **7 Claims**



1. A method of recognizing a word containing a number of bits in a data stream, comprising:

recirculating a known word in a first shift register clocked in a first direction;

clocking said data stream through a second shift register in a direction opposite from said first direction;

comparing each bit of the known word stored in a respective stage of said first shift register with a bit of said data stream stored in a corresponding stage of said second shift register;

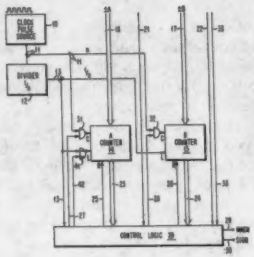
counting the number of comparing bits for each stage of registers during a plurality of clocking periods to determine if said word has been received in said data stream.

4,205,303

PERFORMING ARITHMETIC USING INDIRECT DIGITAL-TO-ANALOG CONVERSION

Carl F. Barnhart, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,244
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**



1. Circuitry for converting a plurality of multi-bit, arbitrarily signed, coded digital input signals into a single analog output signal of predetermined amplitude but a duty cycle related to said digital input signals, said circuitry comprising, in combination:

a source of clock pulses;

divider means for providing a start pulse one out of every n clock pulses;

a pair of presettable counters, each operative while the respective counter is enabled by an enabling signal to count in a predetermined direction and at a rate determined by successive clock pulses from any numerical value set therein to a predetermined base value indicative of a count termination state;

means for setting the numerical value of each input signal into a respective one of said counters responsively to a start pulse;

means denoting whether the sign of each input signal is positive or negative; and

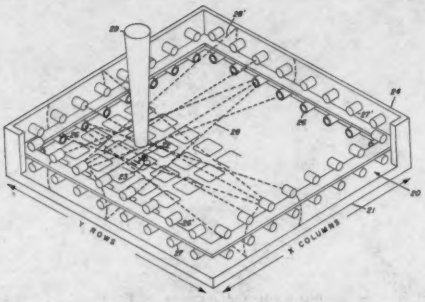
means for providing an enabling signal to each counter successively if the signs of both input signals are identical and concurrently if the signs of the input signals are different, thereby to generate a pair of binary signals representing the magnitude and sign, respectively, of a ternary analog output signal, the average value of which varies substantially linearly with changes in algebraic sum of the numerical values represented by said input signals and said predetermined base value.

4,205,304

TWO DIMENSIONAL LIGHT BEAM SELECTION SYSTEM

Stanley E. Moore, Los Gatos, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sep. 22, 1977, Ser. No. 835,718
Int. Cl.² G28C *1/00*; G21C *7/00*; G08C *21/00*
U.S. Cl. 340—365 P **12 Claims**



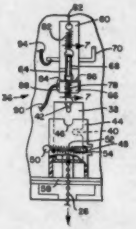
1. A selection system including a two-dimensional map of a plurality of selection positions arranged in columns and rows comprising: a selectively energizable light emitter at one end of each of said columns for emitting light in the direction of the columns; a normally disabled light detector at the other end of each of said columns for receiving light from the light emitters of the columns and responsive thereto to produce an output signal; means for successively energizing the light emitters of said columns, means for successively enabling the light detectors of said columns in synchronism with the energization of the light emitters thereof whereby the light detector of a column is enabled only in coincidence with the energization of the light emitter of the column; and column detection means for indicating the absence of an output signal from an enabled light detector of said columns.

4,205,305

BURGLAR ALARM

Tatsuji Nakada, 2, 35, 5-Chome, Tachibana, Sumida-ku, Tokyo, Japan

Filed May 23, 1978, Ser. No. 908,837
Int. Cl.² G08B *13/08, 13/12*
U.S. Cl. 340—548 **7 Claims**



1. A burglar alarm for signaling relative motion between a first surface and a second surface, comprising:

a housing attachable to said first surface;

a magnet;

a flexible elongated member having first and second ends, said first end being attached to said magnet;

a switch assembly mounted within said housing, said switch assembly comprising a fixed first contact having first and second side, a second contact pivotably mounted adjacent

to the first side of said first contact, a linearly movable element positioned adjacent to the second side of said first contact and linearly movable therefrom, said linearly movable element having a side with a slot therein, the second end of said flexible elongated member being attached to said linearly movable element, and first means cooperating with said linearly movable element for moving said second contact into electrical contact with said first contact and keeping said second contact in electrical contact with said first contact when said linearly movable element has been displaced a predetermined threshold distance, said first means inclusing a pin pivotably mounted adjacent to the side of said linearly movable element having said slot therein and spring means for urging said pin toward the side of said linearly movable element having said slot therein, said pin moving into said slot when said linearly movable element has been displaced said predetermined distance;

second means connected to said switch assembly for producing a continuing sound when said first contact is in electrical contact with said second contact; and

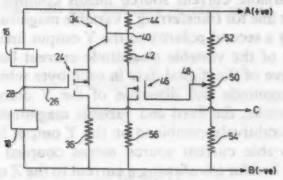
manually operated means movable between "on" and "off" positions and cooperating with said pin for moving said second contact out of electrical contact with said first contact when said linearly movable element is not displaced and said manually operated means is moved to "off" position.

4,205,306

BATTERY OPERATED SMOKE DETECTOR ELECTRONICS

Zbigniew W. Turlej, Toronto, Canada, assignor to Dicon Systems Limited, Toronto, Canada

Filed Jan. 9, 1978, Ser. No. 867,671
Int. Cl.[2] G08B *17/10*
U.S. Cl. 340—629 **7 Claims**



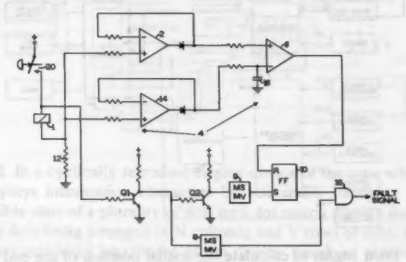
1. An electronic smoke detector for setting off an alarm on detecting a predetermined concentration of combustion products in the air, said detector having constant sensitivity throughout useable battery life, said detector comprising an ionization chamber having a radioactive source for ionizing molecules of air in such chamber and a pair of electrodes in such chamber for establishing an electric field in the chamber region between them, a battery for applying voltage across such chamber by way of said electrodes where presense of the predetermined concentration of combustion products in such chamber causes an increment in the voltage drop across such chamber, the increment in voltage drop increasing as the battery voltage decreases for the same concentration of combustion products in the air, a first electronic means adapted to monitor the voltage drop across such chamber, said first electronic means having a predetermined alarm threshold corresponding to the increment in voltage drop for a fully charged battery at which it causes an alarm signal for said predetermined concentration of combustion products, a second electronic means adapted to detect decrease in said battery voltage and adapted to adjust upwardly said alarm threshold on detecting decrease in said battery voltage to compensate for said increase in voltage drop increment so that said first electronic means causes such alarm signal at approximately the same predetermined concentration of combustion products in the air throughout useable battery life.

4,205,307

DEVICE FOR MONITORING THE FUNCTION OF ELECTROMAGNETS

Peter Liermann, Gehrden, and Lutz Weise, Mainz, both of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 956,001
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—644 **6 Claims**



1. Apparatus for monitoring the operation of a solenoid, which includes an electromagnet having a movable armature normally occupying a first position and operating to another position when the electromagnet is energized, comprising in combination,

(a) a sensing means coupled to said electromagnet and responsive to current flow through the electromagnet winding for sensing variations in that current when said armature operates to its energized position after said electromagnet is initially energized,

(1) said sensing means generating an output signal when an armature actuated current variation is sensed,

(b) a memory means coupled to said electromagnet and responsive to current flow for registering an indication of the initial application of energy to said electromagnet and for generating an output signal while said indication is stored,

(1) said memory means further controlled by said sensing means for cancelling said registered indication of said energy application when a sensing means output signal is generated,

(c) timing means coupled to said electromagnet and responsive to the initial application of energy to said electromagnet for initiating a predetermined timing period,

(1) said timing period having a length longer than the normal interval from initial energization to operation of said armature,

(2) said timing means normally producing an output signal except during said timing period, and

(d) a detector means coupled to said memory means and said timing means and responsive to the simultaneous reception of the output signals from both such means for producing a fault signal indicating the non-operation of said armature after energization of said electromagnet.

4,205,308

PROGRAMMABLE ALARM SYSTEM FOR MARINE LOADING ARMS

Frank P. Haley, Upland, and Louis S. McTamaney, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 21, 1977, Ser. No. 853,800
Int. Cl.[2] G08B *21/00*; B65B *1/04*; G01C *1/00*; G01B *3/56*
U.S. Cl. 340—686 **19 Claims**

1. An apparatus for sensing the position in space on the end

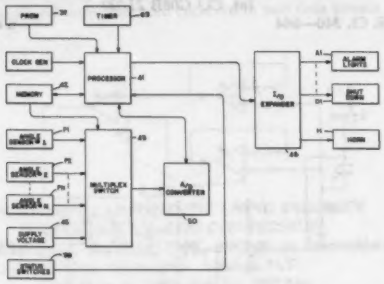
of an articulated arm having a plurality of pivotally interconnected limbs, a first one of which is pivotally mounted on a fixed support, the apparatus comprising:

means for sensing a first angle representative of the vertical orientation of said first limb;

means for sensing a second angle representative of the horizontal orientation of said arm;

means for sensing a third angle representative of the vertical orientation of a second limb;

calculator means for using the values of said first, second and



third angles to calculate the spatial position of the end of said articulated arm;

means for storing the spatial boundaries of a working area for said end of said arm;

means for comparing the actual spatial position of the end of said arm with said boundaries;

means for calculating the velocity of the end of said arm and for extending the boundaries of said working area by an amount which is dependent upon the arm velocity; and

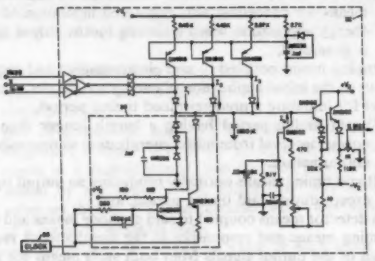
means for generating an alarm signal when the spatial position of said end of said arm equals any of said boundaries.

4,205,309

CHARACTER GENERATOR

John Music, Melbourne, Fla., assignor to Documation Incorporated, Melbourne, Fla.

Filed Feb. 21, 1978, Ser. No. 879,088
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—739 **12 Claims**



1. A character generator for generating highly accurate electronic reproductions of characters of any chosen style on the screen of a CRT display unit by simultaneously controlling the orientation, length and intensity of substantially linear strokes formed by the electron beam of the CRT comprising:

a. input means for receiving data representative of selected characters and converting said data into digital character addresses;

b. random access memory means coupled to said input means and having a data storage position corresponding to each CRT display position for storing a digital character address in each storage position, each digital character address being representative of the character to be displayed in each CRT screen display position;

c. means coupled to said random access memory means for loading digital character addresses into selected memory storage positions of said random access memory means and for sequentially reading out on a data output line the digital character addresses stored in said random access memory means;

d. read only memory means, including a plurality of multibyte microprograms each stored at a predetermined address of said read only memory means and representative of a single character, coupled to the data output line of said random access memory means for sequentially reading out each byte of the microprogram designated by each sequentially received digital character address, each byte containing digital data defining the magnitude and direction of the X, Y and Z components of each stroke formed by the electron beam; and

e. digital to analog converter means coupled to said read only memory means for converting the sequentially generated bytes of each microprogram read out from said read only memory means into three independent analog signals, said digital to analog converter means having X, Y and Z output lines and including

i. X fixed current source means coupled to the X output line for transferring a fixed magnitude current having a first polarity to the X output line

ii. X variable current source means coupled to the X output line for transferring a variable magnitude current having a second polarity to the X output line, the magnitude of the variable magnitude current being representative of the digital data in each byte which defines the magnitude and direction of the X component of each stroke, the fixed and variable magnitude currents being additively combined on the X output line

iii. Y fixed current source means coupled to the Y output line for transferring a fixed magnitude current having a first polarity to the Y output line.

iv. Y variable current source means coupled to the Y output line for transferring a variable magnitude current having a second polarity to the Y output line, the magnitude of the variable magnitude current being representative of the digital data in each byte which defines the magnitude and direction of the Y component of each stroke, the fixed and variable magnitude currents being additively combined on the Y output line.

v. Z variable current source means coupled to the Z output line for transferring a current to the Z output line having a magnitude representative of the digital data in each byte which defines the intensity of each stroke;

whereby said digital to analog converter means converts the sequentially generated bytes of each microprogram read out from said read only memory means into three independent analog signals for controlling the position and intensity of the CRT electron beam to form a selected character on the screen of the CRT by connecting substantially constant intensity, variable length linear strokes in patterns determined by each selected microprogram.

4,205,310

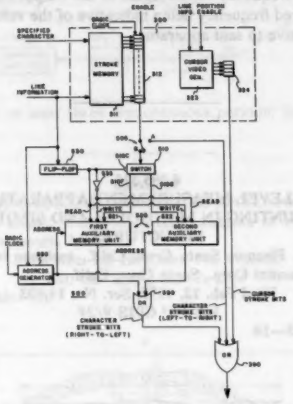
TELEVISION TITLING APPARATUS AND METHOD

Renville H. McMann, Jr., New Canaan, and Joseph Bakach, Bridgeport, both of Conn., assignors to Thomson-CSF Laboratories, Inc., Stamford, Conn.

Filed May 22, 1978, Ser. No. 908,084
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—750 **10 Claims**

1. In an apparatus for receiving a sequence of character-representative signals and for generating video control signals which are suitable for controlling a scanned display, said apparatus including timing generator means for generating timing signals which are synchronized with the display scan; character storage means for storing the character-representative

signals and periodically reading out character-representative signals which correspond to a character in the sequence; and stroke generator means responsive to the timing signals and the character-representative signals for producing stroke bits of the character to be displayed; a compatible subsystem for presenting characters of a language which reads right-to-left, comprising:



means for storing, in said stroke generator means, reverse image stroke representations of a font of characters of said language;

auxiliary storage means for storing a scanline of stroke bits from said stroke generator means; and

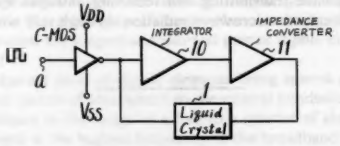
means for reading out said scanline of stroke bits from said auxiliary storage means, said scanline of stroke bits being read out in reverse order from the order in which they were read into said auxiliary storage means.

4,205,311

LIQUID CRYSTAL DISPLAY DEVICE

Ken Kutaragi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,312
Claims priority, application Japan, Sep. 14, 1977, 52-110881
Int. Cl.[2] G02F 1/13
U.S. Cl. 340—784 **8 Claims**



1. A liquid crystal display device comprising:

(a) a liquid crystal display cell interposed between first electrode means and second electrode means;

(b) exciting means applied to said first electrode means for obtaining an exciting voltage; and

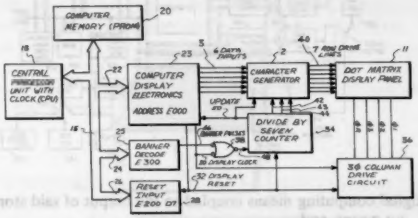
(c) integrating means applied to said second electrode means for obtaining a substantially mean DC voltage by integrating said exciting voltage.

4,205,312

METHOD AND APPARATUS FOR CAUSING A DOT MATRIX DISPLAY TO APPEAR TO TRAVEL

Jack P. Nelson, Agoura, Calif., assignor to Computer Kinetics Corporation, Westlake Village, Calif.

Filed Nov. 11, 1977, Ser. No. 850,778
Int. Cl.[2] G06K 15/18
U.S. Cl. 340—792 **22 Claims**



1. In a cyclically refreshed display device of the type which displays information characters by selectively changing the visible state of a plurality of dots on a dot matrix display panel, the dots being arranged in N columns and Y rows of dots, said rows extending lengthwise of the display panel, an electrical circuit for causing the displayed characters to appear to travel across the display panel, said circuit comprising:

first means for sequentially enabling adjacent columns in the display along the length thereof;

second means for providing row-drive signals, selectively causing each dot of each column enabled by said first means to have a predetermined visible state;

a clock circuit for generating a display clock for synchronizing said first means with said second means;

means for generating a reset pulse for resetting said first and second means after N columns have been enabled to cause said first means to repeat sequencing through said columns and to cause said second means to repeat sequencing through its selection of dots to have said predetermined visible states; and

means for periodically altering said synchronizing means including means for selectively generating banner pulses, and gate means for combining said banner pulses with said display clock to define a banner display clock, said banner display clock being routed to one of said first and second means, the other of said first and second means receiving unaltered display clock, said banner display clock periodically incrementing said one of said first and second means by at least one column position, thereby displaying the information characters periodically stepwise displaced along the length of the display panel.

4,205,313

MARINE RADAR INCLUDING ANTICOLLISION UNIT

William M. Pease, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 25, 1978, Ser. No. 899,952
Int. Cl.[2] G01S 7/44
U.S. Cl. 343—5 DP **14 Claims**

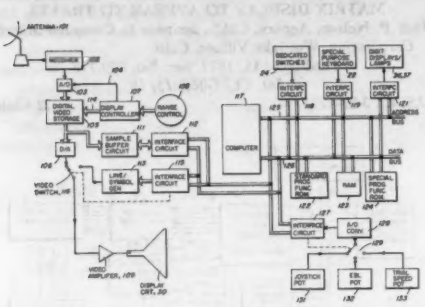
1. In combination:

means for forming digital samples of radar return signals, said digital samples being taken of said received signals at intervals of time determined by a radar range setting;

means for storing said digital samples of the received radar return signals;

means for reading said samples out of said storing means

sequentially at a rate constant over a plurality of radar range settings;



digital computing means coupled to the output of said storing means; and

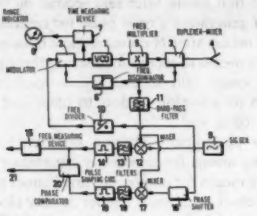
a visual display coupled to said digital computing means.

4,205,314

DEVICE FOR MEASURING THE RANGE OF A MOVING TARGET AND THE SPEED AT WHICH IT APPROACHES OR RECEDES

Raymond Strauch, Viroflay, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Dec. 19, 1977, Ser. No. 862,005
Claims priority, application France, Dec. 29, 1976, 76 39390
Int. Cl.[2] G01S *9/44, 9/02, 9/23*
U.S. Cl. 343—9 R **4 Claims**



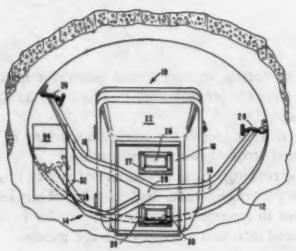
1. An apparatus for measuring the range and the recessional or approach speed of a target comprising means for generating a radio signal, means for frequency modulating said radio signal by a triangular waveform modulating signal of duration T to produce a linearly frequency modulated radio signal, means for transmitting said frequency modulated radio signal toward said target, means for receiving the radio signal reflected from said target, means for generating a beat signal between the transmitted and received signals, a frequency discriminator coupled to said beat signal generating means, said discriminator having a center frequency f_o and generating an error signal corresponding to the difference between f_o and the frequency of said beat signal, said error signal being coupled to said modulating means and controlling the slope of said triangular waveform of said modulating signal generated thereby so as to maintain the frequency of said beat signal equal to f_o, means for deriving from said triangular waveform a signal indicative of the range of the target, further means for generating a first signal of a constant frequency f_1 which is equal to the average value of f_o, means coupled to said modulating means for producing a second signal of a constant frequency f_1/n, where n is the order of the harmonics of the transmitted modulation signal whose frequency is nearest to f_o, said second signal controlling said modulating means so as to maintain the duration Tr between the start of two consecutive triangular waveforms of said modulating signal constant and equal to n/f_1, a mixer having an output, a first input coupled to said further means and a second input coupled to said means for generating said beat signal, a bandpass filter having an output and having an input connected to the output of said mixer, said filter having a maximum cut-off frequency equal to $f_1/2n$, and means coupled to said output of said filter for measuring the frequency of the signal at the output of said filter, the measured frequency being indicative of the velocity of the target relative to said apparatus.

4,205,315

FLUID LEVEL MEASUREMENT APPARATUS FOR MOUNTING IN MANHOLES AND SIMILAR STRUCTURES

Richard P. Fleenor, Santa Cruz, Calif., assignor to Manning Environmental Corp., Santa Cruz, Calif.

Filed Feb. 12, 1979, Ser. No. 11,403
Int. Cl.[2] G01S *9/24*
U.S. Cl. 343—14 **4 Claims**



1. A fluid level measurement apparatus for mounting in manholes and similar structures comprising:

support means including,

a bracket means having a seat portion and a plurality of support arm portions, each support arm having a terminal section positioned above said seat portion, said seat portion defining at least two spaces apart microwave antenna windows,

clamping means coupled to each of said terminal sections for selectively engaging and disengaging said bracket means from the inner rim of a manhole; and

microwave depth gauge means at least partially supported by said seat portion for determining fluid level beneath said support means, said microwave depth gauge means having microwave transmitting and receiving antennas spaced to communicate microwave radiation through said windows.

4,205,316

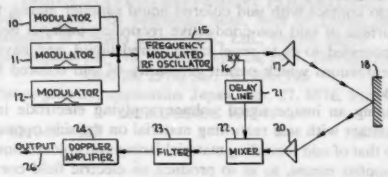
ENHANCED ACCURACY DOPPLER FUZE

Salvador J. Peperone, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1967, Ser. No. 624,671
Int. Cl.[2] G01S *9/24; F42C 13/04*
U.S. Cl. 343—14 **6 Claims**

1. A method of improving the resolution and accuracy of

FM-CW radar distance measuring systems comprising the step of simultaneously modulating the carrier signal with each of a



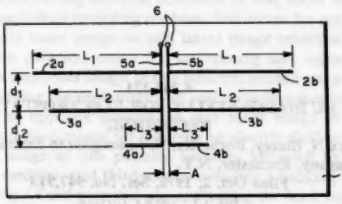
plurality of at least three asynchronous periodic linear wave signals.

4,205,317

BROADBAND MINIATURE ANTENNA

Paul T. K. Young, Westwood, Mass., assignor to Louis Orenbuch, Weymouth, Mass.

Filed Dec. 21, 1978, Ser. No. 971,652
Int. Cl.² H01Q 21/12, 9/44
U.S. Cl. 343—720 **4 Claims**



1. A broadband antenna comprising

(1) a pair of parallel closely spaced elongate central conductors, each of said central conductors being connected at one end to antenna output terminal means,

(2) a plurality of pairs of dipole elements, the two elements of each pair being equal in length, the elements of each pair being disposed symmetrically on opposite sides of said closely spaced central conductors and extending outwardly therefrom, each element having its inner end connected to the adjacent one of the pair of closely spaced central conductors,

(3) the length of the longest pair of dipole elements being approximately one eighth the wavelength of the lowest frequency in the broadband,

(4) the length of the shortest pair of dipole elements being in the range of one third to one quarter of the wavelength of the highest frequency in the broadband,

(5) the length of a third pair of dipole elements being a half wavelength at some intermediate frequency in the broadband, the third pair of dipole elements being disposed between the longest and shortest pair of dipole elements, and

(6) adjacent pairs of dipole elements being spaced apart at their points of attachment to the central conductors by a distance in the range of a half to a quarter of the wavelength at the highest frequency in the broadband.

4,205,318

MINI-INDOOR TV ANTENNA

Vincent F. Pisano, 654 NE. 56th St., Miami, Fla. 33137

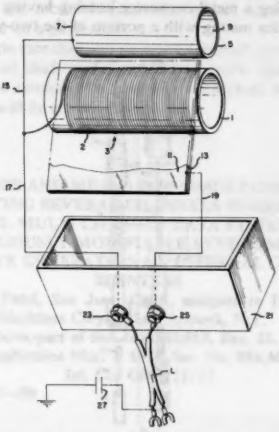
Filed Jan. 15, 1979, Ser. No. 3,588
Int. Cl.² H01Q 9/26
U.S. Cl. 343—741 **8 Claims**

1. An antenna for receiving signals in the television band, comprising:

a conductor wound about a linear axis to form an elongated helix,

an elongated hollow cylindrical member of non-magnetic metal located within said helix in non-contacting relation with said conductor and extending substantially the length thereof,

said cylindrical member being closed at one end by a plate of non-magnetic metal,



one end of said conductor being electrically connected to said cylindrical member adjacent said closed end,

a layer of electrical insulating material supported by said helix,

a metallic foil sheet wrapped directly about said insulating layer,

a first electrical terminal connected to said one end of the conductor, and

a second electrical terminal connected to the foil.

4,205,319

FLEXIBLE DIPOLE ANTENNA FOR HAND-HELD TWO-WAY RADIO

Bernard Gasparaitis, Ft. Lauderdale, and Charles D. Albright, Lantana, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 5, 1978, Ser. No. 903,318
Int. Cl.² H01Q 9/16
U.S. Cl. 343—792 **4 Claims**

1. A method of constructing a dipole antenna for portable radio use and comprising the steps of:

(a) cutting to approximately on-half wavelength a coaxial cable consisting of a center conductor of stranded wire, a layer of insulation over the stranded wire, a braided shield over the insulation layer; and an outer insulating jacket over the braided shield;

(b) stripping said jacket from all but a small portion of the cable length;

(c) stripping the shield from approximately the upper half of said cable and a very short length of the lower end thereof;

(d) removing the inner insulating layer from a very short portion of the lower end of said cable;

(e) permanently affixing a connector pin to the lower end of said cable;

(f) slipping a flexible, molded insulating sleeve onto the cable and over the still-shielded portion thereof;

(g) providing a portion of braided shielding formed with a portion having an inside diameter substantially equal to the outside diameter of the shielded portion of the cable

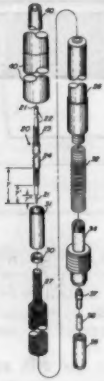
and a second portion having an inside diameter substantially equal to the outside diameter of the insulating sleeve;

(h) placing said formed shield over the insulating sleeve and the exposed portion of the cable shield;

(i) applying a metal ring over the double layer of shielding and crimping said ring thereon;

(j) applying a section of heat shrink tubing over the crimped ring and the smaller portion of the formed shield and heat shrinking the tubing thereon;

(k) providing a metal connector housing having a threaded portion for mating with a portion of the two-way radio;



(l) inserting a molded section of flexible insulating elastomer into the connector housing;

(m) inserting a portion of a flexible conductive elastomer into the center of the insulating elastomer;

(n) providing a coil spring formed of music wire and having a pitch at the upper end for mating with threads on the lower end of the insulating sleeve and at the other end having a pitch for mating with threads on the upper end of the connector; and

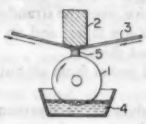
(o) providing a resilient insulating cover over the entire antenna.

4,205,320

WET TYPE DIRECT IMAGE RECORDING METHOD

Tadashi Fujii, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 27, 1978, Ser. No. 946,185
Claims priority, application Japan, Sep. 30, 1977, 52-118178
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—1.1 **8 Claims**



1. A wet type direct image recording method comprising the steps of:

impregnating a colored liquid into a surface of a colored liquid supplier means, said surface having depressions which permits capillarity of said colored liquid, and which are distributed uniformly all over said surface, and at least either of said colored liquid and said surface being electrically conductive,

scraping said colored liquid so as to leave it only in said depressions,

bringing an electrically non-conductive recording material into contact with said colored liquid supplier means, the surface of said non-conductive recording material being processed so as to repel said colored liquid, and having depressions which permit capillarity of said colored liquid,

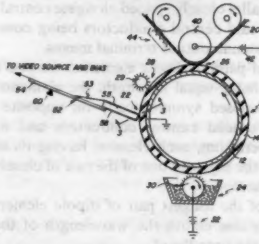
bringing an image signal voltage applying electrode into contact with said recording material on the side opposite to that of said recording material facing said colored liquid supplier means, so as to produce an electric field corresponding to an image to be recorded, across said recording material between said electrode and said colored liquid or said colored liquid supplier means, said electric field being capable of attracting said colored liquid in said depressions to the surface of said recording material.

4,205,321

DC BIASED STYLUS FOR ELECTROSTATIC RECORDING

Richard N. Blazey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,913
Int. Cl.[2] G03G *15/052*
U.S. Cl. 346—153 **7 Claims**



1. In an electrostatic stylus recorder of the type including (a) a recording element comprising a dielectric layer disposed on an electrically conductive member; (b) an electrically conductive stylus, said stylus being mounted adjacent said dielectric layer; (c) circuit means for producing an RF field between said stylus and said conductive member, said RF field being of sufficient intensity to ionize air molecules in the vicinity of said stylus and thereby produce an air plasma comprising positively-charged ions; and (d) means for applying a video signal to said stylus to cause said stylus to imagewise charge said dielectric layer; the improvement comprising:

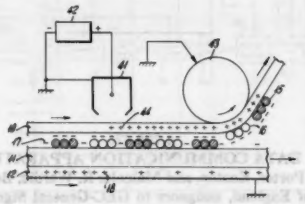
means for electrically biasing said stylus to a negative potential relative to said conductive member, said biasing means comprising a DC voltage source operatively connected to said circuit means and to said stylus, said bias being sufficient to render said stylus more attractive to said positively-charged ions than said conductive member at all times said RF field is produced, whereby said positively-charged ions are prevented from impacting upon said dielectric layer.

4,205,322

ELECTROSTATIC METHOD OF SIMULTANEOUSLY TRANSFERRING TO A RECORDING MEDIUM A TONER IMAGE HAVING DIFFERENT POLARITIES

Mitsuo Tsuzuki, and Michihisa Suga, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 790,875, Apr. 26, 1977. This application Oct. 30, 1978, Ser. No. 955,716
Claims priority, application Japan, Apr. 27, 1976, 51/49097
Int. Cl.[2] G03G *15/044*
U.S. Cl. 346—153 12 Claims



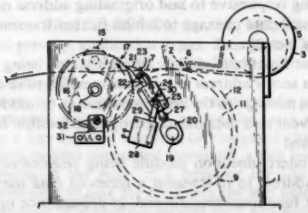
1. An electrostatic recording apparatus comprising a latent image retentive medium, means for forming a toner image of toner particles having different polarities on said latent image retentive medium, a recording medium, first means for corona-charging said toner image on said latent image retentive medium to one polarity, means for superposing said recording medium on said toner image of one polarity, second means for corona-charging the back surface of said recording medium to superpose an opposite polarity on said toner image of one polarity, and third means for inducing an electric field so that the toner image of one polarity becomes attracted to said recording medium, said third means including a backing electrode having a fixed potential and contacting the back surface of said recording medium, said second means being positioned between said first means and said third means so that a potential which is substantially equal to said fixed potential of said backing electrode may become uniformly distributed within said recording medium before said backing electrode contacts the back surface of said recording medium, whereby a high-speed transfer may be carried out when said recording medium has a high electrical resistivity, and gaseous discharge between said recording medium and said latent image retentive medium may be prevented when said recording medium is separated from said latent image retentive medium.

4,205,323

PAPER FEED CONTROL

George C. Williams, S. Easton, and Edward W. Fay, W. Bridgewater, both of Mass., assignors to Alden Research Foundation, Brockton, Mass.

Filed Jul. 31, 1978, Ser. No. 929,403
Int. Cl.[2] G01D *15/24*
U.S. Cl. 346—165 11 Claims



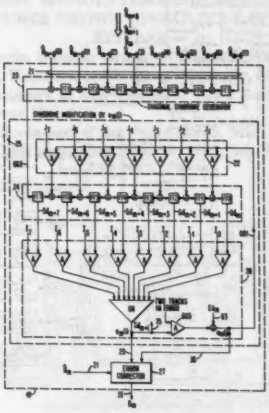
1. A graphic recorder of electrical signals comprising:
means defining a recording zone and including a linear electrode in combination with a scanning electrode which is disposed on a drum that rotates on a drum shaft;
means for holding a supply of recording paper;
feed roll means having a feed roll shaft disposed therein to draw said recording paper through the recording zone;
a ratchet wheel fixedly mounted on said feed roll shaft whereby when said ratchet wheel is rotated, said feed roll means is turned;
means to index said ratchet wheel including a pawl engaging at least one tooth of said ratchet wheel, said pawl being disposed on a pawl shaft;
an eccentric cam disposed on said drum shaft, means causing said pawl shaft to follow said eccentric cam whereby when an extreme of eccentricity is reached, the feed roll means will be advanced stepwise.

4,205,324

METHODS AND MEANS FOR SIMULTANEOUSLY CORRECTING SEVERAL CHANNELS IN ERROR IN A PARALLEL MULTI CHANNEL DATA SYSTEM USING CONTINUOUSLY MODIFIABLE SYNDROMES AND SELECTIVE GENERATION OF INTERNAL CHANNEL POINTERS

Arvind M. Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 863,653, Dec. 23, 1977. This application Mar. 7, 1978, Ser. No. 884,463
Int. Cl.[2] G06F *11/12*
U.S. Cl. 371—50 11 Claims

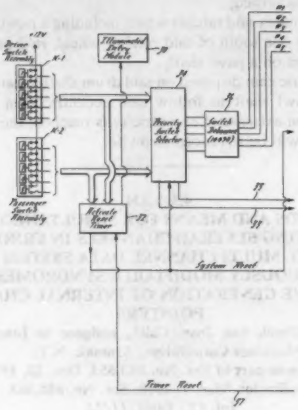


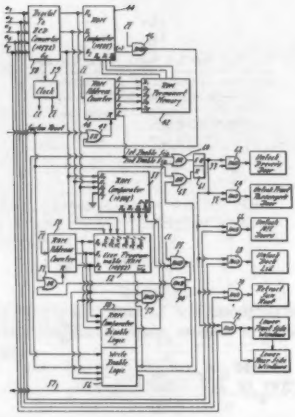
1. In combination: A parallel multi-channel data handling system, including one or more data channels, and an apparatus for correcting several channels in error simultaneously, said apparatus comprising:
means for encoding and writing into a first channel, vertical parity checks and for encoding and writing into a second channel diagonal parity checks taken over the channels, including the data channels, in a predetermined, positively or negatively sloped direction;
means for determining syndromes from the parity checks and data written into the channels;
means for detecting a mismatch among the vertical and diagonal syndromes intersecting the same error; and
means responsive to the detected mismatches for generating a pointer to an unknown error channel as a function of the displacement along the channel between the first mismatch and the next subsequent mismatch among the vertical and diagonal syndromes.

4,205,325
KEYLESS ENTRY SYSTEM

Juan C. Haygood, Detroit, and Ted L. Harman, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1977, Ser. No. 865,033
Int. Cl.[2] H04Q 3/02; E05B 47/02; H02G 3/00
U.S. Cl. 340—147 MD 20 Claims





1. A keyless entry system for use in an automotive vehicle comprising:

means for entering at least one multi-digit code into said system and generating representative electrical signals;

means for permanently storing a predetermined code representing n sequential digits, where n is a predetermined number;

first means for addressing said permanent storing means in response to each individually entered digit;

means for storing a user programmed code representing n sequential digits;

second means for addressing said user code storing means in response to each individually entered digit;

means for sequentially comparing each individually digit entered into said system with the read out contents of said permanent storing means and with the read out contents of said user code storing means, wherein said comparing means is connected to respective first and second addressing means to advance a corresponding addressing means to its next address whenever a comparison indicates equality and to reset a corresponding addressing means to its initial address whenever a comparison indicates inequality;

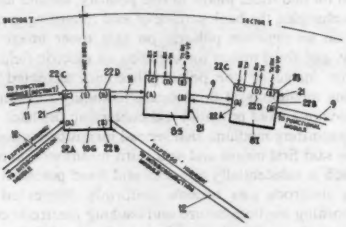
said first and second addressing means respectively generate corresponding first and second enabling signals when sequentially advanced to an n+1th address; and

means for unlocking a door of said vehicle in response to either of said first and second enabling signals.

4,205,326
DATA COMMUNICATION APPARATUS

Cyril A. Porter, Kenton, and Malcolm R. Wardle, Berkhamsted, both of England, assignors to GEC-General Signal Limited, Hertfordshire, England

Filed Feb. 13, 1978, Ser. No. 876,916
Claims priority, application United Kingdom, Feb. 14, 1977, 6089/77
Int. Cl.[2] H04Q 9/00; H04J 3/00
U.S. Cl. 340—147 R 7 Claims



1. In a train describer system, data communication apparatus comprising

(A) a multiplicity of modules serially connected in a first closed loop,

(B) said modules being disposed in sectors,

(C) each of said sectors comprising a group of functional modules,

(D) said sectors being interconnected by interconnection modules,

(E) said interconnection modules being directly interconnected in a second closed loop in parallel with said first closed loop,

(F) each functional module imposing an originating address on any data message initiated by that functional module and being responsive to said originating address on reception of said data message to inhibit further transmission of the data message,

(G) the last functional module in each sector being responsive to a sector address in said data message to re-transmit said data message to the next interconnection module only in the event said data message originated within the same sector, and

(H) each interconnection module being responsive to said sector address to re-transmit a received data message to the next functional module and, in dependence upon said sector address, to the next interconnection module,

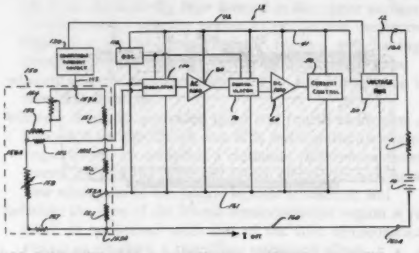
(I) a data message originating at a particular functional module being thereby transmitted to every sector by way of said second closed cloop.

4,205,327

TWO WIRE CURRENT TRANSMITTER WITH ADJUSTABLE CURRENT CONTROL LINEARIZATION

Charles J. Dahlke, New Germany, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 13, 1978, Ser. No. 886,095
Int. Cl.[2] G08C 19/04; G01K 7/24
U.S. Cl. 340—208 22 Claims



1. A two wire transmitter having two terminals for connection to two wires from a series connected source of DC voltage and a load, the two wire transmitter comprising:

a voltage regulator means powered solely through said terminals to provide a stable output voltage;

a sensing circuit including sensor means which is variable as a known nonlinear function of a parameter for providing electrical signals as a function of variation of the sensor means;

a current source powered by said voltage regulator means solely through said terminals for providing an energizing current to energize said sensing circuit, said current source including linearizing impedance means having an impedance having a predetermined relationship to said known non-linear function, and wherein said energizing current flows through said linearizing impedance means;

means connected to said sensing circuit and coupled between said two terminals to adjust the current flowing through said two terminals as a function of the electrical signals from said sensing circuit;

means sensitive to the current flowing through said two terminals to provide a feedback signal to said sensing circuit to cause said electrical signals to tend to return to a known state; and

means for adjusting the energizing current from said current source energizing said sensing circuit as a function of the current flowing through said two terminals to provide a linearizing effect on the relationship between the parameter sensed by the sensor means and the current flowing through said two terminals.

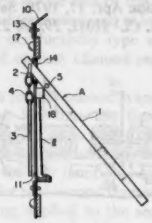
4,205,328

APPARATUS FOR CONTROLLING A POWER SOURCE FOR AN ELECTRICAL ALARM OR INDICATOR

Motohiro Gotanda, No. 3-6-29, Inokashira, Mitaka-City, Tokyo, Japan

Filed Jan. 9, 1978, Ser. No. 867,947
Claims priority, application Japan, Jan. 20, 1977, 52/4680[U]
Int. Cl.[2] G08B 19/00; H01H 9/00
U.S. Cl. 340—521 4 Claims

1. An apparatus for controlling actuation of a power source for an electrical alarm device, or the like, said apparatus including: a key holding member of elongated shape having a permanent magnet associated therewith, a key box adapted to be provided at the front of a hotel or the like including a corresponding opening for receiving the key holding member after the door of a room is locked by a key held by the key holding member thereby leaving the room vacant, a reed switch provided in the key box and located relative to the key holding member such that when said key holding member is received in said opening the permanent magnet associated with said key holding member renders the reed switch operative, and an electrical circuit, connected to the reed switch and including an indicator lamp for indicating whether or not the associated room is vacant and an electrical alarm device for,



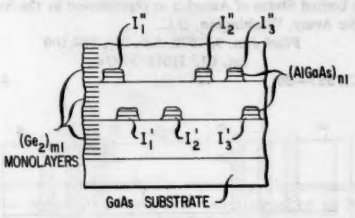
when enabled, indicating whenever the associated room is broken into or a fire starts in the room, for causing said lamp to change state so as to indicate that the associated room is vacant and for enabling said alarm device responsive to said reed switch being rendered operative.

4,205,329

PERIODIC MONOLAYER SEMICONDUCTOR STRUCTURES GROWN BY MOLECULAR BEAM EPITAXY

Raymond Dingle, Summit; Arthur C. Gossard, Warren; Pierre M. Petroff, Westfield, and William Wiegmann, Middlesex, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 671,565, Mar. 29, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,845
Int. Cl.[2] H01L 29/26
U.S. Cl. 357—16 15 Claims



1. A periodic semiconductor structure comprising in each period:

m contiguous monolayers of epitaxial Ge_2 having a major surface, and

a plurality of islands of epitaxial $Al_xGa_{1-x}As$ $(0 \leqq x \leqq 1)$ formed on said major surface, the quantity of material in said islands being equivalent to m contiguous monolayers of $Al_xGa_{1-x}As$ on said surface.

12. In a double heterostructure, a semiconductor body comprising:

a semiconductor core region adapted for the propagation of radiation therein,

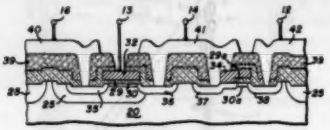
a pair of cladding regions which bound said core region so that said radiation is guided therein, characterized in that:

said cladding regions each comprise a superlattice of $(GaAs)_n(AlAs)_m$ where n and m are the number of contiguous monolayers of GaAs and AlAs, respectively, in each period of said superlattice.

4,205,330
METHOD OF MANUFACTURING A LOW VOLTAGE N-CHANNEL MOSFET DEVICE

Thomas Klein, Saratoga, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Division of Ser. No. 783,914, Apr. 1, 1977, Pat. No. 4,104,784.
This application Apr. 17, 1978, Ser. No. 896,658
Int. Cl.[2] H01L *29/78, 27/02*
U.S. Cl. 357—23 8 Claims



1. An integrated circuit structure including in combination an enhancement MOSFET and a depletion MOFSET, said structure comprising:

a substrate having a resistivity of about 10 ohm centimeters or greater of one conductivity type;

a first region of increased impurity concentration of said one conductivity type in at least the region of the gate of said enhancement transistor and in the field region surrounding said transistors;

a second region of said one conductivity type reduced impurity concentration, said second region lying within that portion of said first region located under the gate of said enhancement transistor;

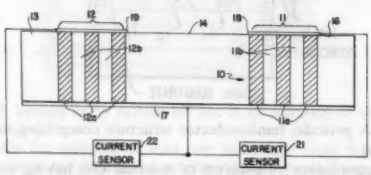
a third region of opposite conductivity type located under the gate of said depletion transistor; and

means for coupling said transistors together and into a circuit.

4,205,331
INFRARED OPTICAL DEVICES OF LAYERED STRUCTURE

Leo Esaki, Chappaqua; George A. Sai-Halasz, Mohegan Lake, and Leroy L. Chang, Lake Mohegan, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 9, 1978, Ser. No. 914,100
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 4 Claims

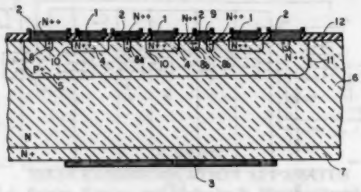


1. An optical detection device comprising: first and second superlattice semiconductor regions joined by an insulator; each said region including two different materials arranged alternately in parallel layers to form a plurality of semiconductor heterojunctions; the bottom of the conduction band of one of said materials in each said region being lower than the bottom of the conduction band of the other of said materials in said region to form a series of potential wells and potential barriers across each said region; each said potential well having at least two quantized allowed energy states separated by an energy corresponding to a light frequency; said energy separation for all of said potential wells being equal in each said region and being different for different ones of said regions; and current sensing means attached to said layers for selectively sensing currents flowing in said regions.

4,205,332
QUICK-QUENCHING POWER TRANSISTOR

Mario Conti; Gian P. Chiavarotti, both of Milan, and Sandro Luciani, Saronno, all of Italy, assignors to SGS-Ates Componenti Elettronici S.p.A., Milan, Italy

Filed Jul. 6, 1978, Ser. No. 922,505
Claims priority, application Italy, Jul. 8, 1977, 25518 A/77
Int. Cl.[2] H01L *29/72*
U.S. Cl. 357—34 5 Claims

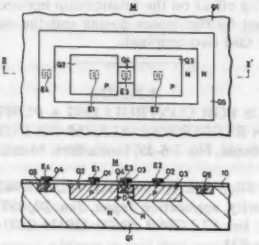


1. A junction transistor comprising a semiconductor body with a collector layer of one conductivity type, an adjoining base layer of the opposite conductivity type forming a surface of said body, an emitter layer of said one conductivity type embedded in said base layer along said surface and separated by said base layer from said collector layer, an insular ancillary layer of said one conductivity type embedded in said base layer along said surface in proximity to said emitter layer but separated by said base layer from said emitter and collector layers, and a set of electrodes in contact with said collector, base and emitter layers, respectively, said electrodes including a metallic contact layer on said surface bridging said base and ancillary layers.

4,205,333
LATERAL TRANSISTOR WITH MULTI-BASE CONTACTS

Yousuke Yamamoto, Musashino, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 851,272, Nov. 14, 1977, abandoned, which is a continuation of Ser. No. 619,391, Oct. 3, 1975, abandoned. This application Mar. 15, 1979, Ser. No. 20,644
Claims priority, application Japan, Jul. 10, 1974, 49-115396
Int. Cl.[2] H01L *29/74*
U.S. Cl. 357—35 1 Claim



1. A semiconductor device comprising:

a first semiconductor region of a first conductivity type formed of a semiconductor substrate and serving as a base region of a lateral bipolar transistor;

second and third semiconductor regions of a second conductivity type formed in the upper surface of the first semiconductor region and serving as emitter and collector regions of the lateral bipolar transistor, respectively;

a fourth semiconductor region of the first conductivity type

formed in the upper surface of the first semiconductor region to extend between the second and third regions and having a lower resistance than the first semiconductor region; and

first and second electrodes deposited on the second and third semiconductor regions, respectively to serve as emitter and collector electrodes of the lateral bipolar transistor, respectively;

wherein there is provided a fifth semiconductor region of the first conductivity type formed in the upper surface of the first semiconductor region to encompass the second, third and fourth semiconductor regions and having a lower resistance than the first semiconductor region;

wherein the first semiconductor region has a resistance less than 500 ohm-cm;

wherein there are provided third and fourth electrodes are deposited on the fourth and fifth semiconductor regions, respectively, to establish a potential difference therebetween, each of the third and fourth electrodes serving as a base electrode of the lateral bipolar transistor; and

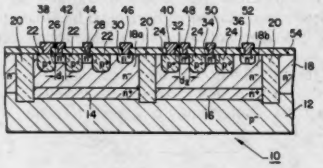
wherein the area of the fourth semiconductor region is very small as compared with that of the fifth semiconductor region to produce a spreading resistance effect.

4,205,334

INTEGRATED SEMICONDUCTOR DEVICE

Terumoto Nonaka; Tadahiko Hotta, and Shin Yamashita, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 17, 1978, Ser. No. 925,624
Claims priority, application Japan, Jul. 27, 1977, 52-90146
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—41 **6 Claims**



1. An integrated semiconductor device including at least one normally-on type first junction field effect transistor and at least one normally-off type second junction field effect transistor both being formed in a single common semiconductor body,

said first transistor comprising: a first semiconductor region having a first conductivity type and formed in said semiconductor body; a gate region having a second conductivity type opposite to said first conductivity type and provided in said first semiconductor region to surround at least one portion of said first semiconductor region, thereby defining at least one current channel region oriented perpendicular to one surface of said semiconductor body; at least one source region having said first conductivity type and provided at one end of said current channel region; and at least one drain region having said first conductivity type and provided at the other end of said current channel region,

the width of said channel region in a direction parallel to a principal surface of said semiconductor body being such as to cause the channel region to be rendered conductive in the absence of external bias being applied to said gate region during operation of said first transistor,

said second transistor comprising: a second semiconductor region having said first conductivity type and formed in said semiconductor body but isolated from said first semiconductor region and having the same impurity concentration as said first semiconductor region; a gate region having said second conductivity type and provided in said second semiconductor region to surround at least one portion of the second semiconductor region, thereby defining at least one current channel region oriented perpendicular to said one surface of said semiconductor body; at least one source region having said first conductivity type and provided at one end of the current channel region of the second transistor; and at least one drain region having said first conductivity type and provided at the other end of said current channel region of said second transistor,

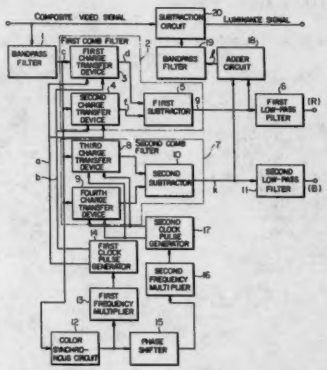
said channel region for the second transistor having in said direction a width less than the first transistor channel region width and such as to cause this channel region to become substantially pinched off by a depletion layer extending from the p-n junction between said gate and channel regions for said second transistor in the absence of external bias being applied to the second transistor gate region during operation of said second transistor.

4,205,335

CIRCUIT ARRANGEMENT FOR SEPARATING CHROMINANCE AND LUMINANCE INFORMATION IN A COMPOSITE VIDEO SIGNAL OF AN NTSC SYSTEM

Isao Nakagawa, Yokohama; Hiroaki Nabeyama, Kamakura, and Tomomitsu Kuroyanagi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 21, 1978, Ser. No. 888,657
Claims priority, application Japan, Mar. 24, 1977, 52-31543
Int. Cl.[2] H04N *9/535, 9/50*
U.S. Cl. 358—31 **2 Claims**



1. A circuit arrangement for separating chrominance and luminance signals in a composite video signal of an NTSC system comprising:

(a) a first bandpass filter for extracting a modulated color signal from said composite video signal;

(b) a first comb filter including a first charge transfer device for sampling and transferring said modulated color signal with use of a first clock pulse signal of the frequency of a color subcarrier signal, a second charge transfer device for sampling said composite video signal with use of a second clock pulse signal having the same frequency as said first clock pulse signal but an opposite phase thereto and delaying the transfer of said sampled signal for a single horizontal scanning period relative to the output signal from said first charge transfer device and a first subtraction circuit for determining arithmetically a difference signal between the output signals from said first and second charge transfer devices;

(c) a second comb filter including a third charge transfer device for sampling said composite video signal with use of a third clock pulse signal having a same frequency as that of said first clock pulse and having a predetermined

phase different from that of said first clock signal, a fourth charge transfer device for sampling said modulated color signal with a fourth clock pulse having the same frequency as said third clock pulse signal but an opposite phase thereto and delaying the sampled color signal for the single horizontal scanning period relative to the output signal from said third charge transfer device and a subtraction circuit for arithmetically determining a difference signal between the output signals from said third and fourth charge transfer devices;

(d) an adder circuit for arithmetically determining a sum signal of the output signals from said first and second comb filters;

(e) a second bandpass filter for extracting from said sum signal only the modulated color signal; and

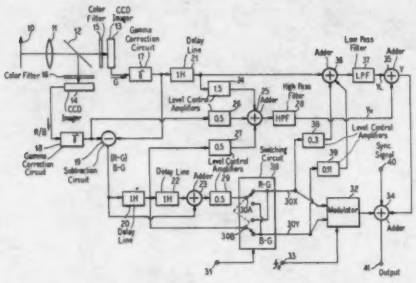
(f) a third subtraction circuit for arithmetically determining a difference signal between said composite video signal and said modulated color signal, whereby a demodulated color output signal is obtained from each of the output signals of said first and second comb filters through a low-pass filter, while a luminance output signal is obtained from said third subtraction circuit.

4,205,336

SIGNAL PROCESSING SYSTEM

Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 18, 1978, Ser. No. 935,005
Claims priority, application Japan, Aug. 30, 1977, 52-10400
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—43 **15 Claims**



1. A signal processing system for a color television camera having at least a line-sequential type color coding filter disposed in a light path of an object image, comprising:

(a) an image pick-up device on which said object image is focused;

(b) means for deriving a line sequential type color output signal alternately formed of non-delayed first and second color signals from said image pick-up device;

(c) delay means for alternately delaying said first and second non-delayed color signals by two horizontal scan intervals 2H, said delay means also having a 1H delay output; and

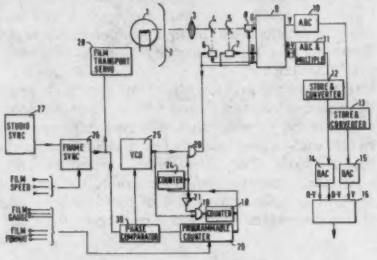
(d) mixing means for interpolating the first color signal when the second color signal is present at the 1H delay output by adding the 2H delayed first color signal to the non-delayed first color signal, and interpolating the second color signal when the first color signal is present at the 1H delay output by adding the 2H delayed second color signal to the non-delayed second color signal, so that said mixing means creates a mixed signal forming a portion of a luminance signal of the color television camera.

4,205,337

TELEVISION FILM SCANNER

John David Millward, Hitchin, England, assignor to The Rank Organisation Limited, London, England

Filed Jul. 5, 1978, Ser. No. 922,108
Claims priority, application United Kingdom, Jul. 6, 1977, 28285/77
Int. Cl.[2] H04N 5/36, 9/04
U.S. Cl. 358—54 **15 Claims**



1. Apparatus for producing television picture signals from motion picture film, said apparatus comprising

means for repeatedly scanning the film horizontally along a single fixed line at a scanning station; means for transporting the film vertically past the scanning station during such horizontal scanning to produce a plurality of sequential line scan signals;

means for varying the scanning repetition frequency of the horizontal scanning so as to permit, for any one of a plurality of different film sizes and/or transport speeds, a predetermined number of horizontal lines scans to be performed in respect of each frame of the motion picture film, and

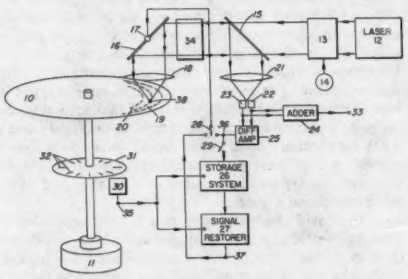
means for processing said line scan signals to produce a plurality of television picture fields having line and field frequencies conforming to a predetermined television standard.

4,205,338

DISC RECORDING TRACKING SYSTEM

Louis F. Schaefer, Palo Alto, Calif., assignor to Laser File Inc., Los Angeles, Calif.

Filed Nov. 3, 1977, Ser. No. 848,125
Int. Cl.[2] H04N 5/76
U.S. Cl. 358—28.5 **14 Claims**



1. In a method for recording on a disc the steps of:

tracking a previously recorded track on the disc using two adjacent photosensors positioned to read radially adjacent portions of the track and producing a radial tracking signal from the difference of the output of the two photosensors;

measuring the fundamental frequency components of the radial tracking signal using an amplitude detector and a phase detector;

storing the fundamental components of the radial tracking signal using an amplitude store and a phase store; and

controlling the radial position of the newly recorded tracks using the stored components of the radial tracking signal.

4,205,339

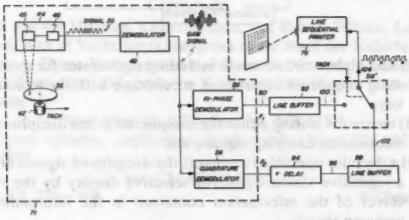
FRAME STORAGE AND RETRIEVAL WHEREIN THE FRAME FIELDS ARE QUADRATURE AMPLITUDE MODULATED ON A SINGLE CARRIER

Dennis G. Howe, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,174

Int. Cl.[2] H04N 5/76

U.S. Cl. 179—100.1 G **12 Claims**



1. A method of recording a video frame of information on a recording medium, said frame being comprised of two fields, said method comprising the steps of:

quadrature amplitude modulating the two fields of information on a carrier to produce a QAM signal;

and recording said QAM signal on said recording medium, thereby forming a single track recording comprised of both fields of said frame of information.

4,205,340

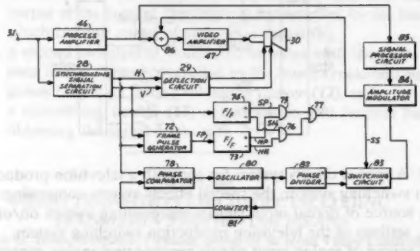
CIRCUIT FOR MAKING A CRT DISPLAY A TV PICTURE FOR A COPY WITH DOTS SUPERPOSED ON HALF-TONE PICTURE AREAS

Akiyoshi Kouno; Masanobu Morishita, and Yoshio Yui, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,982

Int. Cl.[2] H04N 5/84, 1/40

U.S. Cl. 358—130 **12 Claims**



1. A circuit for use in a device comprising a cathode-ray tube responsive to a cathode-ray tube input signal for displaying a picture and means for forming a monochrome copy of said picture on a copying medium, said circuit being responsive to a sequence of discrete signal blocks included in a television signal for producing said cathode-ray tube input signal, said television signal comprising vertical synchronizing signals at a first predetermined period, horizontal synchronizing signals between two adjacent ones of said vertical synchronizing signals at a second predetermined period, and luminance components between two adjacent ones of said horizontal synchronizing signal, said signal blocks having signal levels variable between a first and a second level, said first and second levels inclusive, each of said signal blocks comprising the luminance components included in said television signal in a preselected interval longer than said second predetermined period and not longer than twice said first predetermined period, said picture having luminance levels dependent on said cathode-ray tube input signal, wherein the improvement comprises:

first means responsive to at least one of said signal blocks for producing a succession of dot superposed signals in a succession of the preselected intervals, respectively, said dot superposed signals comprising at least one of said signal blocks, the dot-superposed signal produced in each of the preselected intervals of said succession further comprising a plurality of dot signals superposed on those portions of the signal block included in the dot-superposed signals of said succession in said each preselected interval which have the signal levels intermediate between said first and second levels, each of said dot signals in each of the preselected intervals being substantially inphase with the respective dot signals in at least one of said preselected intervals that next follows the last-mentioned each interval; and

second means for delivering said dot-superposed signal from said first means as said cathode-ray tube input signal.

4,205,341

PICTURE SIGNAL CODING APPARATUS

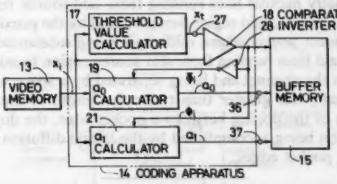
Eiji Mitsuya, Yokohama; Tomio Kishimoto, Yokosuka; Katsusuke Hoshida, Hoya, and Naohiko Kamae, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,541

Claims priority, application Japan, Jan. 24, 1978, 53-6388; Jan. 24, 1978, 53-6389; Jan. 24, 1978, 53-6390

Int. Cl.[2] H04N 7/12

U.S. Cl. 358—135 **10 Claims**



1. A picture signal coding apparatus comprising:

threshold value setting means for setting at least one threshold value for each of a plurality of coding blocks into which a frame of a gray-scaled picture is divided, based on the luminance distribution in each block;

means for classifying the luminance level of each picture element of each coding block into any one of level ranges defined by the threshold value to obtain a resolution component;

typical luminance level calculating means for obtaining at least two typical luminance levels from the classification result and the brightness levels of the picture elements of each coding block;

decoding means for decoding the picture elements of each

coding block based on the resolution component and the threshold value;

error calculating means for a calculating a coding error in the coding of the coding block from each decoded picture element and its original picture element;

block size changing means for comparing the calculated error with a set value to change the size of each coding block in accordance with the compared output; and

means for providing, as true coded outputs, the resolution component and the typical luminance levels when the error is in a predetermined range.

4,205,342

INTEGRATED CIRCUIT STRUCTURE HAVING REGIONS OF DOPING CONCENTRATION INTERMEDIATE THAT OF A SUBSTRATE AND A POCKET FORMED THEREIN

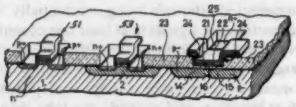
Mougahed Y. Darwish, Fontaines, and Henri J. Oguey, Corcelles, both of Switzerland, assignors to Centre Electronique Horologer S. A., Neuchatel, Switzerland

Filed Apr. 21, 1978, Ser. No. 898,681

Claims priority, application Switzerland, May 5, 1977, 5637/77

Int. Cl.[2] H01L 29/78, 27/04, 21/22

U.S. Cl. 357—23 **4 Claims**



1. An integrated circuit comprising a semi-conductor substrate of a first conductivity type, at least one pocket of doping formed in said substrate which has a conductivity opposite said first type, said pocket having a lateral diffusion of doping extending beyond the edges thereof, and at least one metal oxide semiconductor transistor having spaced drain and source regions of said first conductivity type in at least one of said pockets and a gate formed above the semi-conductor substrate surface between said drain and source regions by a thin dielectric film covered by a conducting material, the region under said gate defining a channel and having a surface doping concentration between that of said substrate and that of said pocket, said channel having side boundaries defined by two substantially parallel lines running from said source region to said drain region, said region being formed by the proximity of two adjacent pocket edges, said edges being substantially parallel to said lines running from said source region to said drain region in the channel and being separated by a space which is substantially not greater than twice the length of the lateral diffusion of the doping between a pocket edge, the doping of said region being accomplished by the lateral diffusion of said adjacent pocket edges.

4,205,343

TELEVISION SYSTEM TRANSMITTING ENCIPHERED DATA SIGNALS DURING FIELD BLANKING INTERVAL

James H. Barrett, London, England, assignor to Independent Television Companies Association, London, England

Filed Nov. 8, 1976, Ser. No. 739,623

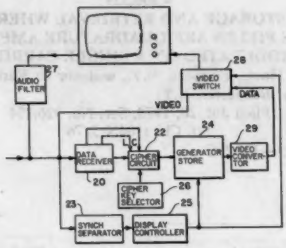
Int. Cl.[2] H04N 7/08

U.S. Cl. 358—147 **8 Claims**

1. A television system receiving terminal for displaying a picture corresponding to the picture signal which terminal is for use with a transmitting terminal which includes a source of video signals, means operable to superimpose, or otherwise add to the video signals without interfering with the picture signal, digitally coded information carrying signals, wherein the digitally coded information carrying signals are enciphered prior to transmission, in accordance with a predetermined key, and including:

(a) means for extracting the enciphered information carrying signals from the video signals;

(b) a cipher circuit means, including user operable selection means for selecting a desired key from a number of keys, for operation in accordance with the selected key to decipher received enciphered information carrying signals;



(c) said cipher circuit means including a generator for generating a sequence of pulses in accordance with the selected key;

(d) means for storing either the enciphered or the deciphered information carrying signals; and

(e) a decoder operable to convert the deciphered signals into a repetitive vision signal for selective display by the receiver of the information contained in the information carrying signals.

4,205,344

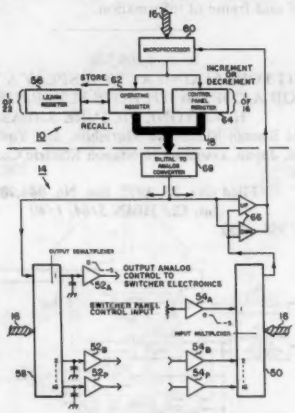
SPECIAL EFFECTS MEMORY SYSTEM

Bruce L. Rayner, Nevada City, Calif., assignor to The Grass Valley Group, Valley, Calif.

Filed Jun. 5, 1978, Ser. No. 912,900

Int. Cl.[2] H04N 7/00

U.S. Cl. 358—160 **5 Claims**



1. A special effects system for use with a television production switching system; the special effects system comprising:

a source of digital input signals representing switch on/off settings of the television production switching system;

a source of analog input signals representing analog control settings of the television production switching system;

means for storing said digital input signals and digital equivalents of said analog input signals; and

an addressable bi-directional analog interface connected

between said analog input signal source and said storage means, said analog interface comprising:

(a) addressable means for selecting one of said analog input signals, said selecting means being responsive to input address commands;

(b) means connected to said storage means for converting the selected ones of said analog input signals to said digital equivalents for storing in said storage means and also for converting said stored digital equivalents to analog output signals; and

(c) addressable means for connecting one of said analog output signals to the television production switching system for controlling the operation thereof, said connection means being responsive to output address commands.

4,205,345
METHOD AND DEVICE FOR ELIMINATING THE BACKGROUND BRIGHTNESS VARIATION OF A VIDEO SIGNAL

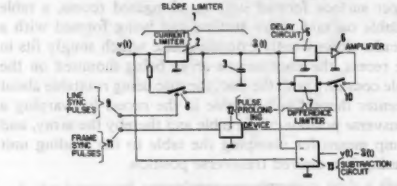
Derk van der Houwen, Leidschendam, and Robert Wilcke, Leiden, both of Netherlands, assignors to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

Filed May 22, 1978, Ser. No. 908,507

Claims priority, application Netherlands, May 27, 1977, 7705875

Int. Cl.² H04N *5/14*

U.S. Cl. 358—168 **8 Claims**



1. Device for eliminating the background brightness variation of a video signal, comprising:

a. a slope limiter (1), comprising a a video signal current input V(t) having line and frame synchronizing pulses, a current limiter (2) comprising a full wave rectifier circuit and a capacitor (3), and an output signal current a(t) which is limited as to its rate of build-up;

b. a delay circuit (5) for said output signal current for supplying a signal a(t−T) and terminated by a 1:1 amplifier;

c. a difference limiter (7), for limiting the difference between the output signal current a(t) and the signal a(t−T);

d. a first switch (8), connected between the input and the output of the current limiter (2) and controlled by the line synchronizing pulses of said video signal (9);

e. a second switch (10), connected in series with the difference limiter (7) and controlled by the frame synchronizing pulses (11) via a pulse prolonging device (12), and

f. a subtracting device (13) connected to said limiters for obtaining the signal V(t)−a(t).

4,205,346
VIDEO TRANSITION CIRCUITRY INCLUDING TRANSITION PREVIEWING MEANS

John D. Ross, Iroquois, Canada, assignor to Ross Video Limited, Iroquois, Canada

Filed Jun. 9, 1978, Ser. No. 914,611

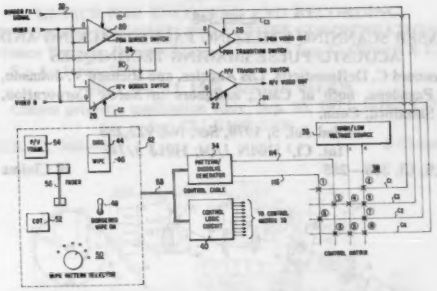
Int. Cl.² H04N *5/22*

U.S. Cl. 358—181 **17 Claims**

1. Improved video transition circuitry including means for previewing transitions from an on-air event signal to a next event signal comprising

program transition means responsive to said on-air event and next event signals for outputting the on-air event signal;

preview transition means responsive to said on-air event and said next event signals for outputting said next event signal; and



transition control means for either (a) controlling said program transition means to effect a predetermined transition at the output of said program transition means from said on-air event signal to said next event signal or (b) controlling said preview transition means to effect a preview of the said predetermined transition at the output of said preview transition means.

4,205,347
TELEVISION SIGNAL DETERMINATION IN AN AUTOMATIC TUNING SYSTEM

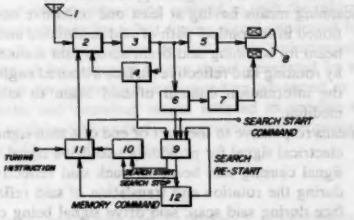
Nobuo Minoura, Ohtawara; Isao Matsumura, Yaita; Yasukazu Yoshinaga, Yaita; Takao Abumi, Yaita, and Kazuhiro Nakai, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 26, 1978, Ser. No. 900,246

Claims priority, application Japan, Apr. 30, 1977, 52-51528; Apr. 30, 1977, 52-51531; Sep. 17, 1977, 52-112011

Int. Cl.² H04N *5/44*

U.S. Cl. 358—191.1 **13 Claims**



1. A television signal determination circuit in an automatic tuning system comprising:

a first counter means for counting the number of received synchronizing signals;

a reference clock signal generator for developing reference clock pulses of a predetermined frequency;

a second counter means for counting said reference clock pulses derived from said reference clock signal generator;

count operation control means for initiating count operations of said first and second counter means at the same time upon receiving the synchronizing signal; and a determination means for comparing contents of said first and second counter means and developing a signal determina-

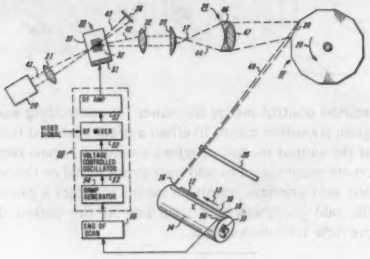
tion output representing whether received signals are the true television synchronizing signal.

4,205,348

LASER SCANNING UTILIZING FACET TRACKING AND ACOUSTO PULSE IMAGING TECHNIQUES

Leonard C. DeBenedictis, Los Angeles, and Richard V. Johnson, Pasadena, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1978, Ser. No. 922,259
Int. Cl.[2] H04N *1/04*; H01J *3/14*
U.S. Cl. 358—285 **19 Claims**



1. An improved flying spot scanning system for recording information from an electrical signal onto a scanned medium comprising:

means for providing a beam of radiant energy;

means for generating a signal representing the start or end of a scan;

a Bragg diffraction light-sound interaction medium including a transducer coupled to an acoustic wave transmitting medium characterized by a predetermined acoustic wave propagation velocity, said medium both modulating and deflecting said beam in accordance with the information content of a drive signal applied thereto,

scanning means having at least one reflective surface positioned in the optical path of said modulated and deflected beam for scanning said beam across said scanned medium by rotating said reflective surface a desired angle to impart the information content of said beam to said scanned medium;

means responsive to the start or end of a scan signal and said electrical signal for providing said drive signal, said drive signal causing said beam to track said reflective surface during the rotation and translation of said reflective surface during said scan, said drive signal being coupled to said transducer for also propagating intensity-modulated acoustic waves in said medium at a predetermined velocity, said beam of radiant energy being projected through said medium in a direction transverse to said acoustic waves to produce in said medium a moving image of information corresponding to said electrical signal, said image moving at said predetermined velocity, and

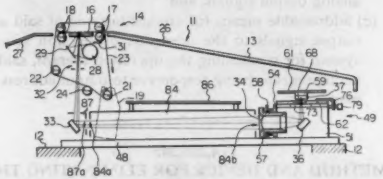
optical means interposed in the path of said intensity modulated beam and having magnification M associated therewith, for minimizing image blur on a recording medium said moving image being projected onto said scanned medium with said beam in a manner such that the velocity of said moving image is substantially equal to and in an opposite direction as the velocity of said scanning beam.

4,205,349

OPTOELECTRONIC SCANNING APPARATUS

Motoaki Kawazu; Takashi Yokota; Toshiyuki Inokuchi, and Yoshiaki Kanmoto, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 24, 1978, Ser. No. 899,245
Claims priority, application Japan, May 7, 1977, 52-51759
Int. Cl.[2] H04N *1/02*
U.S. Cl. 358—294 **5 Claims**



1. An optoelectronic scanning apparatus comprising:

an illumination unit for illuminating an original document; and

a reading unit horizontally spaced from the illumination unit and including a converging lens having a substantially horizontal optical axis, a photosensor array having a light receiving surface facing substantially downwardly and a reflector disposed below the array for reflecting a light image of the document from the lens upwardly onto the light receiving surface of the array;

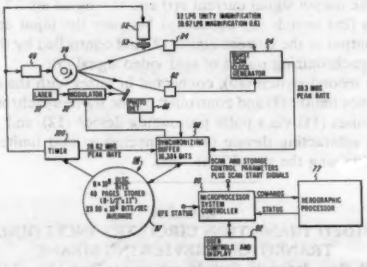
the reading unit comprising a reading unit housing having an upper surface formed with an elongated recess, a table slidable on said upper surface and being formed with a circular downwardly extending disc which snugly fits in the recess, the photosensor array being mounted on the table coaxially with the disc, the disc being rotatable about a center thereof and slidable in the recess for varying a transverse position of the table and thereby the array, and clamp means for clamping the table to the reading unit housing in a desired transverse position.

4,205,350

REPRODUCTION SCANNING SYSTEM HAVING INTERMEDIATE STORAGE BETWEEN INPUT AND OUTPUT SCANNING STATIONS

William F. Gunning, Los Altos Hills, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 776,152, Mar. 10, 1977, abandoned. This application Apr. 5, 1978, Ser. No. 893,721
Int. Cl.[2] H04N *1/04*; G01J *1/20*; G02B *27/17*; G03G *15/28*
U.S. Cl. 358—296 **7 Claims**



1. A scanning system having the capability of scanning originals having images formed thereon in either a normal or inverted mode of operation such that electrical signals representing the scanned images can be stored in storage means such

that when the scanning system reads the stored representations of the images to reproduce the images on a recording medium the reproduced images each having the same image sense comprising:

first means for scanning said originals in a first direction in the normal mode and in a second direction, opposite to said first direction, in the inverted mode,

second means for scanning said originals in a third direction, which is orthogonal to said first and second directions whereby said originals are completely scanned with light,

means for converting the light reflected from said originals into corresponding electrical signals as the originals are scanned on a line to line basis,

buffer memory means for storing said electrical signals in the order in which the electrical signals are generated, and

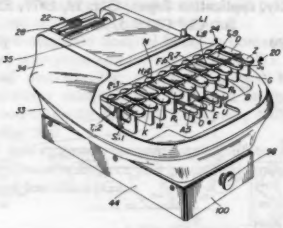
means for unloading said electrical signals stored in said buffer memory means into said storage means in a sequence determined by whether the scanning system is in the inverted or normal mode of operation.

4,205,351

DIGITAL DATA RECORDER

Richard A. Michals, Skokie, Ill., assignor to Stenograph Corporation, Skokie, Ill.

Filed Dec. 8, 1976, Ser. No. 748,511
Int. Cl.[2] G11B *5/00*
U.S. Cl. 360—4 **15 Claims**



1. An improved recorder in combination with a shorthand machine having a keyboard comprising a set of keys wherein numerals words or parts of words correspond to keys or combination of keys; a set of binary switches in one-to-one communication with said set of keys, a first binary state of each of said switches identifying the corresponding key as a key which is activated and a second binary state of each of said switches identifying the corresponding key as a key which is deactivated during a stroke, for designating the word or numeral information of the stroke; and means producing a plurality of parallel, independent data members, one each representing the binary state of one of said switches, said improved recorder of the type adapted for recording on a recording medium in phase encoded, serialized form a single data signal presented for a period defined by a single stroke, the data signal comprising a fixed, finite number of parallel data bits at least one of which is initially of the first binary state and any of which may change binary state during the period, the recorder comprising:

a. detecting means for producing a control signal in response to and during the continuous presence of at least one data bit of the first state, said control signal during corresponding to the period;

b. converter means associated with the detecting means and activated in response to the control signal for sequentially scanning all of the parallel data bits comprising the data signal and for producing a corresponding serial, digital data signal comprising a finite sequence of binary data bits, any of which may change identity during the definable period;

c. memory means coupled to said convertor means for accumulating and thereafter releasing the finite sequence of binary data bits, said memory means recognizing and accumulating as a data bit of the predetermined identity any data bit which is of said predetermined identity at any time during the definable period; and

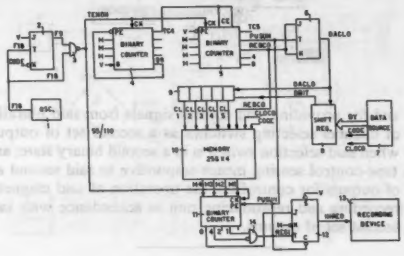
d. encoding means coupled to said memory means for receiving the accumulated and released data bits for producing a phase encoded, serial recording signal for recording on the recording medium.

4,205,352

DEVICE FOR ENCODING AND RECORDING INFORMATION WITH PEAK SHIFT COMPENSATION

Franco Tomada, Pavone, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 13, 1978, Ser. No. 941,935
Claims priority, application Italy, Sep. 30, 1977, 69162 A/77
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—45 **5 Claims**



1. A device for encoding and recording on a carrier, by means of a recording element, information emitted by a data source comprising encoding means for encoding the information coming from said data source in a predetermined recording code, said encoding means generating sequences of signals forming the input to said recording element, error precompensation means included in said encoding means for selectively introducing advances or delays into said sequences of signals, said error precompensation means comprising an addressable memory for permanently storing words corresponding to the advance or delay required by each sequence of signals, a shift register adapted to store the information sequentially in bits, at least part of the shift register being adapted to address said memory, said shift register being enabled to shift the information contained therein by a first timing signal generated by a timing circuit, a counter preset by said words and adapted to be incremented by a second timing signal generated by said timing circuit for generating corresponding advanced or delayed signals, and decoding means adapted to receive said advanced or delayed signals for generating said sequence of signals for said recording element.

4,205,353

COMBINATION DEVICE HAVING A MAGNETIC RECORDING AND REPRODUCING UNIT AND AN ELECTRONIC TUNING TYPE RECEIVER

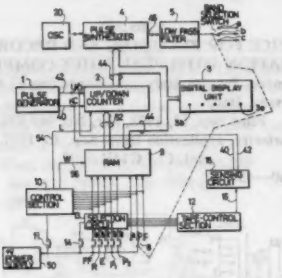
Masanao Okatani; Hiroshi Onishi; Yoshiaki Ishibashi; Reisuke Sato; Hisashi Suganuma; Tomohisa Yokogawa; Yoshiharu Ueki; Haruo Kama; Tadashi Kosuga, and Tadashi Ogawa, all of Kawagoe, Japan, assignors to Pioneer Electronics Corporation, Tokyo, Japan

Filed Jul. 20, 1978, Ser. No. 926,347
Claims priority, application Japan, Jul. 20, 1977, 52-87070
Int. Cl.[2] G11B *15/12*
U.S. Cl. 360—61 **7 Claims**

1. In a combination of an electronic tuning type receiver and a magnetic recording and reproducing unit, wherein said electronic tuning type receiver is of the type which is tuned by

control signals provided to a tuning means by a plurality of channel selecting switches, the improvement comprising:

a. selection circuit means interposed between said tuning means and said plurality of channel selecting switches for providing said plurality of control signals to said tuning means when a selection switch is in the first binary state,



and for providing said control signals from said plurality of channel selecting switches as a second set of outputs when said selection switch is in a second binary state; and

b. tape-control sensing means responsive to said second set of outputs for controlling the operation of said magnetic recording and reproducing unit in accordance with said second set of outputs.

4,205,354

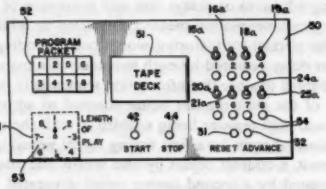
MUSIC DIRECTOR SYSTEM

Justin Kramer, Los Angeles, Calif.

Continuation-in-part of Ser. No. 722,737, Sep. 13, 1976, abandoned. This application Sep. 1, 1978, Ser. No. 938,814

Int. Cl.[2] G11B *15/18*

U.S. Cl. 360—72.1 **8 Claims**



1. A system for playing one or more of a multiple number of melodies from a plurality of items of melody information recorded on a sound tape comprising a strip of tape having a plurality of tracks, each track having plurality of and segments of random length, each item being recorded on a segment of said tape wherein the length of the segment is at least as long as the length of the item, said segments being separated one from another along the tape, there being a longitudinal intermediate portion between opposite ends of the tape, said segments between said longitudinal intermediate portion of the tape and one end being adapted to play during tape travel in one direction and segments between said longitudinal intermediate portion and the other end of the tape being adapted to play during tape travel in the opposite direction, there being a clear segment of tape between each segment, and an electronic sound reproduction circuit means for reproduction of said items recorded on said tape including a loud speaker and start and stop means for energizing and de-energizing the circuit, a plurality of tape heads in operative relationship with the respective tracks, a tape head selector means for selection of one from the plurality of tape heads to be employed, segment selector means for selecting at least one segment having the melody information to be played and play selection counter means for indicating the number of said segments to be played for a given setting, tape deck motor means for driving the tape in forward and in reverse directions, and a tape direction control means for control of said tape deck motor means, said tape direction control means being responsive to the segment selector means and play selection counter means for driving the tape in either forward or reverse direction, location unit means for directing the functions of rewind, advance, and play, said location unit means being responsive to the segment selector means and play selection counter means and in operative association with said tape deck motor means and tape direction control means to successively rewind the tape to the appropriate end and then advance and play the selected segmented, there being included an end-of-play sensor means indicating the end of play of each of the items of melody information recorded on each segment, said play selection counter means being responsive to signals received from the end-of-play sensor means to stop operation of the system after playing the melody information of the last selected segment.

4,205,355

FLEXIBLE DISK DRIVE APPARATUS

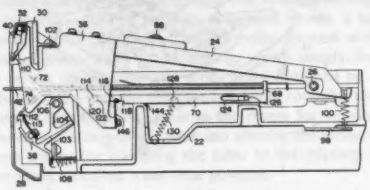
Kunio Hamanaka, Tokyo, and Yoshiki Sakurai, Oume, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 12, 1978, Ser. No. 950,721

Claims priority, application Japan, Oct. 19, 1977, 52-124571

Int. Cl.[2] G11B *5/06*

U.S. Cl. 360—99 **14 Claims**



1. A flexible disk drive apparatus in which a flexible disk cartridge containing a flexible magnetic disk is inserted, whereby information is recorded and/or reproduced in and/or from said disk, comprising:

a main frame;

disk driving means attached to said main frame;

a subframe attached to said main frame for movement between a disk driving position and a cartridge inserting position;

selective clamp means on said subframe and operable to engage said disk driving means whereby said disk is engaged with said disk driving means when said subframe is in said disk driving position, said clamp means being spaced from said disk driving means and said engagement is released when said subframe is in said cartridge inserting position;

ejector means for ejecting said cartridge from said drive apparatus, said ejector means engaging one edge of said cartridge and movable from a released position to a cocked position and including means to latch said ejector means in said cocked position when said cartridge is fully inserted into said drive apparatus; and

releasing means engageable with said ejector means upon movement of said subframe from said disk driving positon toward said cartridge inserting position to release said ejector means from its latched state, whereby said ejector means moves from said cocked position to said released position to eject said cartridge as said subframe moves from said disk driving position to said cartridge inserting position, said releasing means allowing said ejector means to be latched again in said cocked position in response to

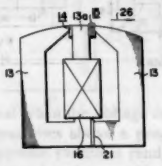
the insertion of said cartridge after said subframe has reached said cartridge inserting position.

4,205,356

ERASING HEAD

Fumio Tanaka, and Naohiko Toshimitsu, both of Chichibu, Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Chichibu, both of, Japan

Filed Jun. 6, 1978, Ser. No. 913,228
Claims priority, application Japan, Jun. 17, 1977, 52-71842
Int. Cl.[2] G11B *5/25, 5/27, 5/47*
U.S. Cl. 360—118 **24 Claims**



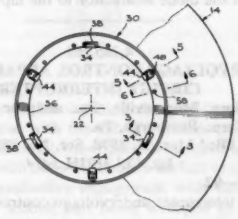
1. An erasing head comprising:
a core of high permeability material and having spaced pole pieces;
a coil wound on said core; and
layers of non-magnetic and high permeability materials alternately disposed between said pole-pieces characterized in that said layers comprise:
a first non-magnetic material being in contact with the upstream pole-piece and having thickness Ga;
a second non-magnetic material disposed between high permeability materials one of which contacts with said first non-magnetic material, and having thickness Gb less than Ga; and
a third non-magnetic material being in contact with the downstream pole-piece and having thickness Gd less than Gb and less than $\frac{1}{3}$Ga.

4,205,357

DISK DRIVE UNIT INCORPORATING A FIELD-REPLACEABLE FIXED DISK ASSEMBLY

Richard E. Barton, Scituate, Mass.; Jack V. Fultz, Thousand Oaks, Calif.; Yoshiyasu Narahara, Westlake Village, Calif., and Michael S. Shebanow, Chatsworth, Calif., assignors to Pertec Computer Corporation

Filed Jun. 15, 1978, Ser. No. 915,787
Int. Cl.[2] G11B *17/02*
U.S. Cl. 360—135 **9 Claims**



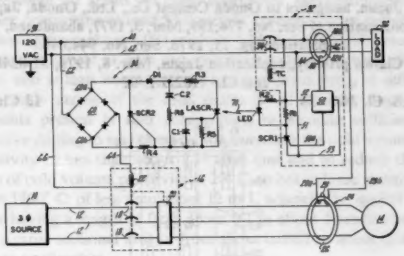
1. A disk assembly for mounting on a disk drive spindle, comprising:
a mounting ring for mounting closely around the drive spindle, said mounting ring defining a central opening to permit said drive spindle to pass therethrough;
at least one data storage disk; and
a coupling connecting said at least one data storage disk to said mounting ring;
said mounting ring including a plurality of flexure members spaced around the ring and extending radially inwardly from most of the rest of the mounting ring to contact the spindle, said flexure members being positioned to define an opening slightly smaller than the diameter of the drive spindle and being deflectable radially outwardly by the spindle to form a controlled interference fit therewith, said flexure members exhibiting substantially the same spring rate of radially outward deflection.

4,205,358

GROUND FAULT PROTECTION SYSTEM

Forest L. Washington, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 955,076
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—44 **6 Claims**



1. A ground fault protection system for a power circuit including a source, a load and a power circuit breaker having contacts connected in series therebetween; said system comprising, in combination:
A. a sensor having a toroidal core embracing the conductors of the power circuit and a secondary winding on said core in which is developed a first ground fault signal indicative of a ground fault on the power circuit downstream from said core;
B. a control power source;
C. a current transformer having a primary winding connected in series with said secondary winding of said sensor and a secondary winding in which is developed a second ground fault signal proportional to said first ground fault signal;
D. a signal processor energized from said control power source and connected to said current transformer secondary winding for processing said second ground fault signal pursuant to developing a trip signal;
E. a first thyristor triggered into conduction by said trip signal to draw activating current from said control power source;
F. a light emitting device energized by said activating current to generate a light signal;
G. a shunt trip solenoid operatively coupled with the power circuit breaker and acting, when energized, to precipitate opening of the power circuit breaker contacts; and
H. a solid state switch including
(1) a silicon controlled rectifier connected in an AC energization circuit with said solenoid, said silicon controlled rectifier having anode, cathode and gate electrodes,
(2) a full-wave diode rectifier bridge having a pair of input terminals and a pair of output terminals, said solenoid connected in said energization circuit in series with said bridge input terminals, said anode of said controlled rectifier connected to one bridge output terminal and said cathode of said controlled rectifier connected to the other bridge output terminal,

(3) a first resistor interconnecting said cathode and gate electrodes of said controlled rectifier, and

(4) a light activated device connected in series circuit with said first resistor across said bridge output terminals;

(5) whereby said light activated device, in response to said light signal, draws current from said bridge through said first resistor to develop thereacross a gate voltage triggering said controlled rectifier in conduction to impose a low impedance path across said bridge output terminals pursuant to energizing said solenoid to precipitate opening of the power circuit breaker contacts.

4,205,359
SAFETY TYPE ELECTRIC FIELD CURTAIN APPARATUS

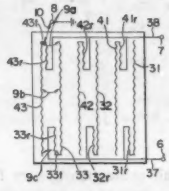
Masahiro Yamamoto, Chiba; Yasunari Okamoto, Tokyo; Tsutomu Itoh, Tokyo, and Senichi Masuda, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Onoda, Japan

Continuation of Ser. No. 774,199, Mar. 3, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,648

Claims priority, application Japan, Mar. 8, 1976, 51-024868

Int. Cl.[2] H02H *1/02*

U.S. Cl. 361—58 **13 Claims**



1. A safety type electric field curtain apparatus comprising:

a planar insulating layer;

a plurality of wire-shaped electrodes embedded within said planar insulating layer at a first predetermined depth from the surface of said layer, said electrodes being parallel to and spaced from each other;

a plurality of protective resistors, each of said protective resistors being coupled in series with one of said electrodes, said protective resistors being embedded in said layer at a second predetermined depth greater than said first predetermined depth, said second predetermined depth being sufficient to prevent grounded body spark ignition of an explosive powder to be processed by a short involving one of said protective resistors, each of said protective resistors having a predetermined resistance value higher than a first minimum A.C. ignition resistance value necessary for preventing spark ignition of an explosive powder to be processed due to grounded body arcs;

a plurality of terminals for coupling an A.C. high voltage power source to said electrodes for generating a silent discharge between adjacent electrodes and establishing an electric field curtain adjacent the surface of said insulating layer;

said electrodes having a ground capacitance with respect to ground and an interelectrode capacitance between adjacent electrodes; and

said first minimum A.C. ignition resistance having a value determined by applying the maximum voltage to be used with said ground capacitance to an equivalent circuit, dispensing the explosive powder to be processed in a spark gap connected in parallel with said ground capacitance, and adjusting a test resistance in series with said ground capacitance until the powder is no longer ignitable, the value of said test resistance being said first minimum A.C. ignition resistance for preventing grounded body arc ignition of an explosive powder to be processed.

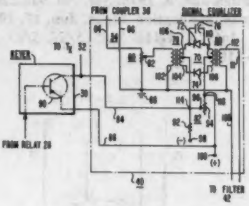
4,205,360
POWER LINE CARRIER APPARATUS

Melvin H. Drucker, Denville, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 24, 1978, Ser. No. 927,217

Int. Cl.[2] H02H *7/20*

U.S. Cl. 361—68 **7 Claims**



1. Power line carrier apparatus, comprising:

local receiver including an input filter,

a local transmitter,

keying means for keying said local transmitter on and off,

a transmission line,

attenuation means,

said receiver being connected to receive communication signals from said transmission line via said attenuation means, with said attenuation means being connected between said transmission line and the input filter of said receiver,

said transmitter being connected to apply communications signals to said transmission line when it is keyed on by said keying means,

said attenuation means having an attenuation which is responsive to whether said transmitter is keyed, presenting a higher attenuation to communication signals from said transmission line when said transmitter is keyed on, then when it is not transmitting,

said attenuation means including a diode modulator connected between the transmission line and the input filter, and bias means for adjusting the bias of said diode modulator in response to the condition of the local transmitter, with said bias means forward biasing said diode modulator when the local transmitter is not transmitting, to enable communication signals to pass from the transmission line to the input filter, and with said bias means reverse biasing said diode modulator when the local transmitter is keyed on, to prevent communication signals from passing through the diode modulator to the input filter.

4,205,361
UNDERVOLTAGE CONTROL APPARATUS FOR CIRCUIT INTERRUPTER

Alan B. Shimp, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1978, Ser. No. 888,725

Int. Cl.[2] H02H *3/24*

U.S. Cl. 361—92 **7 Claims**

1. Circuit interrupter undervoltage control apparatus, comprising;

a holding coil;

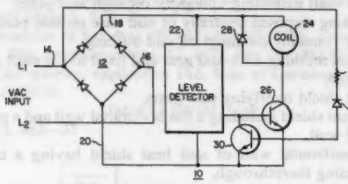
an electronic switch having an output connected in series with said holding coil;

a rectifier having an input connected to alternating current control lines, and an output connected in series with said holding coil and said electronic switch;

a level detector responsive to the output voltage of said rectifier for supplying an activating signal to said electronic switch when said rectifier output voltage rises above a first predetermined value, and removing said

activating signal when said rectifier output voltage falls below a second predetermined value; and

a switching regulator connected to said level detector, said electronic switch, and said rectifier input for modulating



said actuating signal when the voltage on said alternating current control lines rises above a predetermined level, whereby said electronic switch is rendered periodically non-conducting to regulate the average voltage appearing across said holding coil.

4,205,362

APPARATUS FOR MOVING ALONG OR THROUGH A MATERIAL

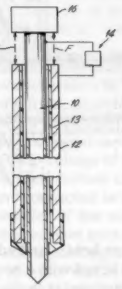
Roy Butterfield, Southampton, England, assignor to National Research Development Corporation, London, England

Filed Feb. 1, 1978, Ser. No. 874,223

Claims priority, application United Kingdom, Feb. 2, 1977, 04206/77

Int. Cl.[2] H02N *1/00*

U.S. Cl. 361—234 **5 Claims**



1. An apparatus for forcing itself along or through soil and like ground material with the aid of the direct application of electricity to the material, the apparatus comprising an annular first part, a first electrically conductive surface to said first part for electrically conductive engagement with the material, a second part, said second part being arranged to be movable relative to the first part and at least in part surrounded by the first part, a second electrically conductive surface to said second part for electrically conductive engagement with the material at a position separated from the first surface, the two conductive parts defining respective terminals of an external electrical path of the apparatus, means for connecting said two electrically conductive surfaces to a source of potential difference to energise the path in operation of the apparatus, electrical insulation in the apparatus between said two parts, and thrust means for exerting a force between the two parts to provide relative axial movement between them.

4,205,363

FUEL IGNITOR COMPRISING A NOVEL SILICON CARBIDE COMPOSITION

Charles J. Boos, Lewiston; Elwood B. Hausler, Grand Island; James A. Hirsch, Niagara Falls; Martin R. Kasprzyk, Buffalo, and Elmer G. Smith, Niagara Falls, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 666,297, Mar. 12, 1976, Pat. No. 4,120,827. This application Jun. 29, 1978, Ser. No. 920,574

Int. Cl.[2] F23Q *7/00*

U.S. Cl. 361—264 **5 Claims**

1. An electrical fuel igniter comprising an elongated body having a composition comprising particulate silicon carbide having an average particle size of less than about twenty microns pressed at a temperature of from about 1800° to about 2400° C. at a pressure of from about 70 to about 750 kilograms per square centimeter for a sufficient time to obtain a density above about 2.5 grams per cubic centimeter, said composition further comprising at least 95.0 weight percent silicon carbide containing from about 0.005 to about 0.05 moles per 100 grams of composition of at least one dissolved negative doping element, said at least one negative doping element being in sufficient mole excess of the total moles of all positive doping elements present in said composition to provide sufficient negative doping to said composition to reduce the cold volume resistivity to less than about 1.25 ohm cms and to reduce the ratio of cold volume resistivity at 20° C. to hot volume resistivity at 1200° C. of less than about 12 to 1, wherein the ignitor is a bar having a length of from about 0.1 to about 5 centimeters and a cross sectional area of from about 0.0002 to about 0.004 square centimeters.

4,205,364

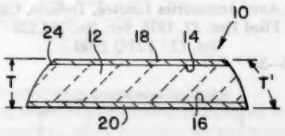
MICROCAPACITORS HAVING BEVELED EDGES AND CORNERS

Robert J. Pereira, Jr., Plainview, N.Y., assignor to Phase Industries, Inc., Huntington Station, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,748

Int. Cl.[2] H01G *4/00*

U.S. Cl. 361—274 **5 Claims**



1. A microcapacitor assembly, comprising:

a dielectric body having upper and lower flat rectangular face parallel to each other, said upper face being smaller in area than said lower face;

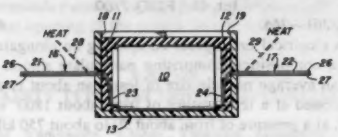
a first metal electrode on said upper face completely covering the same; and

a second metal electrode on said lower face completely cover the same, lateral edges of said first and second electrode registering with corresponding edges of said dielectric body, lateral edges and corners of said dielectric body and adjacent edges and corners of said electrodes being beveled to eliminate abrupt metal to dielectric interfaces, and to reduce any tendency for separation of electrodes from said dielectric body when subject to thermal and mechanical shocks.

4,205,365
BOXED CAPACITOR WITH BIMETALLIC TERMINALS AND METHOD OF MAKING

Robert F. Kalina, Lombard, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,196
Int. Cl.[2] H01G 1/14
U.S. Cl. 361—308 9 Claims



1. A method of terminating an electrical component with a pair of terminals, which comprises:

positioning a pair of bimetallic terminals adjacent said component, with heat activated bonding material interposed between the terminals and the component, said bimetallic terminals being constructed of two laminations of metal having different coefficients of expansion, the laminations of the respective terminals having the lower coefficient of expansion facing said component; and

applying sufficient heat to said terminals to flex them against said component while said interposed heat activated bonding material is activated to bond the terminals to the component.

8. A boxed capacitor, comprising:

a box of insulating material, said box having an open end and a pair of opposed sidewalls;

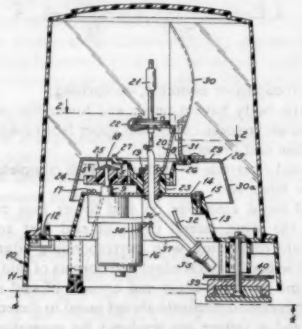
a pair of terminals extending through said sidewalls of said box, each terminal constructed of laminations of metals having different coefficients of expansion, sections of laminations of the respective terminals having the lower coefficient of expansion facing and inclined toward each other; and

a capacitor having heat fusible end electrodes positioned in said box with the end electrodes bonded to the facing laminations of said terminals.

4,205,366
EMERGENCY WARNING LAMP

Arthur F. Bleiweiss; Dumitru Cotoara, both of Toronto, and Robert J. Willkes, Caledon East, all of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

Filed Dec. 27, 1976, Ser. No. 754,125
Int. Cl.[2] F21Q 1/00
U.S. Cl. 362—35 3 Claims



1. In an emergency warning lamp, the combination comprising

a plastic base having a top wall and a peripheral wall,

said top wall including a generally frustoconical wall spaced radially inwardly of said peripheral wall,

a generally horizontal metal mounting plate mounted on said frustonconical wall base,

an electric motor mounted on said plate and having an output shaft extending upwardly through said plate,

a bushing disposed centrally of said base on said plate,

a gear rotatably mounted on said bushing,

a pinion meshing with said gear and fixed to the shaft of said motor,

a heat shield overlying said gears,

said heat shield including a flat horizontal wall and a peripheral wall,

said horizontal wall of said heat shield having a central opening therethrough,

means for supporting said heat shield on said gear on said bushing for rotation with said gear on said bushing

a lamp bulb,

mounting means on said bushing extending through said opening in the horizontal wall of said heat shield for supporting said lamp bulb in spaced relation to said bushing,

a reflector,

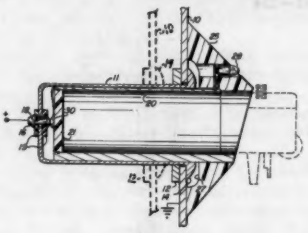
means for mounting said reflector on said horizontal wall of said heat shield for rotation therewith so that it is adjacent said lamp bulb,

the frustoconical portion of said base extending axially upwardly within said peripheral wall of said heat shield.

4,205,367
CIGARETTE LIGHTER HOLDER AND ADAPTER

Benjamin L. Arnold, III, 6051 S. 42nd St., Phoenix, Ariz. 85040, assignor to Benjamin L. Arnold, III, Scottsdale, Ariz.

Filed Nov. 4, 1977, Ser. No. 848,589
Int. Cl.[2] F21V 33/00
U.S. Cl. 362—61 5 Claims



1. A cigarette lighter holder and adapter for use in a motor vehicle having a dash board with a conventional motor vehicle electric cigarette lighter socket in the dash board, said holder and adapter including in combination:

a generally cylindrically shaped housing member, open at one end, for insertion into the electric cigarette lighter socket in the dash board of the motor vehicle, said housing member made at least in part of electrically insulating material for electrically isolating the interior thereof from the exterior thereof;

electrical contact means in the other end of said cylindrically shaped housing member opposite said one end for making electrical contact with an electrical terminal in said cigarette lighter socket;

an outwardly flared collar attached to said one end of said housing member overlying te edge of the cigarette lighter socket; and

electrical illumination means in said collar electrically connected with said electrical contact means in said housing member for energization thereby;

whereby a non electric cigarette lighter may be removably placed in said housing member.

4,205,368

METHOD FOR THE TRANSMISSION OF DC CURRENT BETWEEN AT LEAST ONE RECTIFIER STATION AND SEVERAL INVERTER STATIONS

Manfred Erche, Erlangen-Buckenhof; Ludwig Filberich, Erlangen; Dusan Pove, Nuremberg; Hermann Waldmann, and Manfred Weibelzahl, both of Weiher, near Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

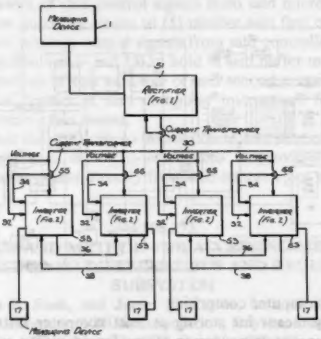
Continuation of Ser. No. 677,962, Apr. 19, 1976, abandoned.

This application Nov. 22, 1977, Ser. No. 853,883

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1975, 2518910

Int. Cl.[2] H02M 5/40

U.S. Cl. 363—35 **3 Claims**



1. A method for the transmission of DC current via a DC network between at least one rectifier station and several inverter stations comprising the steps of:

forming a reference input for the voltage controller of the rectifier of the rectifier station by means of a computing means on the basis of a fixed, predetermined current-voltage characteristic as a function of the maximum possible current in the rectifier station, whereby said rectifier station is voltage-controlled;

forming a maximum value for reference input for the current controller of each inverter station by means of computing means on the basis of a fixed, predetermined voltage-current characteristic which is matched to said current-voltage characteristic and the output capacity of said rectifier station as a function of the voltage of the DC network; and

releasing for control of each current controller via a minimum selection circuit connected in series with that current controller the smaller of the maximum value of the reference input for that current controller and a value for the reference input corresponding to the power demand associated with the inverter station which includes that current controller, whereby each said inverter station is current controlled.

4,205,369

VOLTAGE DROPPING CIRCUIT

Kazuhiro Asano, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

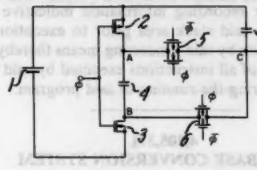
Filed Feb. 9, 1978, Ser. No. 876,369

Claims priority, application Japan, Mar. 28, 1977, 52-34186; Feb. 16, 1977, 52-15916

Int. Cl.[2] H02M 7/00

U.S. Cl. 363—62 **3 Claims**

1. A voltage dropping circuit, comprising: a first MOS field effect transistor, a first capacitor and a second MOS field effect transistor connected in series in the named order; a first MOS field effect transmission gate responsive to control signals of opposite polarity and rendered conductive by a control signal of either polarity and a second capacitor connected in series with said first transmission gate, wherein the series combination of said first transmission gate and said second capacitor are connected in parallel with said first MOS field effect transistor with said first transmission gate connected to a junction of said first MOS field effect transistor and said first capacitor; a second MOS field effect transmission gate responsive to control signals of opposite polarity and rendered conductive by a control signal of either polarity and connected between a junction of said second capacitor and said first transmission



gate and a junction of said first capacitor and said second MOS field effect transistor; means for applying a first control signal to respective gates of said first and second MOS field effect transistors and to said first and second transmission gates so as to render one transmission gate conductive and the other transmission gate non-conductive; and means for applying a second control signal to said first and second transmission gates so as to render one transmission gate conductive and the other transmission gate non-conductive.

4,205,370

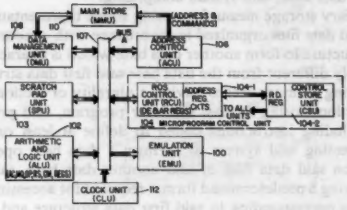
TRACE METHOD AND APPARATUS FOR USE IN A DATA PROCESSING SYSTEM

Allen C. Hirtle, Needham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 16, 1975, Ser. No. 568,643

Int. Cl.[2] G06F 9/16, 13/00

U.S. Cl. 364—200 **23 Claims**



1. A data processing system comprising:

processing means for processing instructions of a program, said processing means including storage means for storing signals for indicating when said processing means is to operate in a trace mode of operation;

a memory having a plurality of segments, one of said segments storing said instructions of said program, each instruction having an op code portion for defining the type of instruction and another one of said segments including a stack area and locations for storing a plurality of control words, at least one of said control words being coded to define types of executable instructions and another one of said control words being coded to define a plurality of modes of operations including said trace mode of operation for said processing means; and,

microprogrammed control means for generating control signals required for processing said instructions, said microprogrammed control means being coupled to said processing means and to said memory, said control means

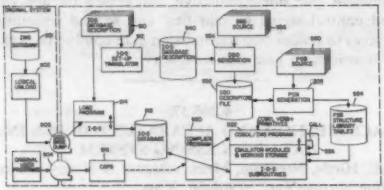
including a plurality of sequences of microinstructions, said control means being operative in accordance with said another one of said control words in response to signals from said storage means indicating said trace mode of operation to reference one of said plurality of sequences for generating said control signals for referencing said one control word during a predetermined point in the processing of each instruction of said program fetched from said one segment, said control means in response to signals derived from said one control word being operative to reference selectively another sequence of said microinstructions for recording information indicative of each instruction in said stack area prior to execution of said each instruction by said processing means thereby providing a history of all instructions executed by said processing means during the running of said program.

4,205,371

DATA BASE CONVERSION SYSTEM

Harvey E. Feather, Hudson, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 3, 1975, Ser. No. 628,671
Int. Cl.[2] G06F 9/00, 13/00
U.S. Cl. 364—200 **25 Claims**



1. A system for executing user programs written for execution on another system and to access data files in said system originally organized in accordance with a first data structure to form a data base, said system comprising:

auxiliary storage means for storing signal representations of said data files organized in accordance with a second data structure to form another data base which is characteristically different from the data base said first data structure;

working memory means having a plurality of sections, one section storing at least one user program, said program including instructions coded to define at least one call directing said system to perform a data base operation upon said data files of said another data base, said call having a predetermined format required for accessing data files corresponding to said first data structure and a second section having a plurality of tables, each table for storing a plurality of entries, said entries of different ones of said plurality of tables being coded for referencing said data base organized in said first data structure in terms of said second data structure;

processor means for executing said instructions of said user programs, said processor means being coupled to said memory means and to said auxiliary storage means; and,

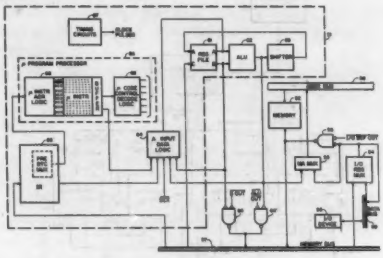
emulator control module means included in said working memory means, said control module means being operatively coupled to said processor means and to said auxiliary storage means, said module means including a plurality of modules, said control module means being operative in response to said instructions of said call for conditioning said processor means to reference different ones of said modules, said processing means including means being conditioned by said different ones of said modules to reference said plurality of tables for interpreting said call instructions to perform the operation specified upon said data files thereby requiring no change in the normal logical operation of said user program when executed by said another system.

4,205,372

CENTRAL PROCESSING UNIT EMPLOYING MICROPROGRAMMABLE CONTROL FOR USE IN A DATA PROCESSING SYSTEM

Ronald H. Gruner, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 509,186, Sep. 25, 1974, Pat. No. 3,990,052. This application Nov. 1, 1976, Ser. No. 737,624
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.[2] G06F 9/12, 13/06
U.S. Cl. 364—200 **7 Claims**



1. In a computer comprising

memory means for storing at least computer instructions, microprogram processor means for providing microprograms of sequences of micro-instructions for performing first certain of said computer instructions, and

memory bus means connected from said memory means for conducting memory output signals representing said computer instructions to said microprogram processor means,

said microprogram processor means including

instruction register means connected from said memory bus means for receiving and holding one of said computer instructions at a time,

micro-instruction control store means connected from said instruction register means for storing and providing said micro-instructions,

controllable connection means connected from said memory bus means for providing first certain of said memory output signals representing portions of second certain of said first certain of said computer instructions present on said memory bus means,

buffer means (1) connected from said control store means for selectively receiving and holding one of said micro-instructions at a time, and (2) connected from said controllable connection means for selectively receiving and holding said portions of said second certain of said first certain of said computer instructions, and

micro-instruction decoding means connected from said buffer means for providing control signals to at least said microprogram processor means,

the method to be practiced therein for generating and responding to the initial micro-instruction of each of said sequences of micro-instructions in each of said microprograms for performing each one of said second certain of said first certain of said computer instructions, said method comprising the steps of:

(A) decoding a present one of first certain of said micro-instructions held in said buffer means by operation of said decoding means to provide first certain of said control signals to said microprogram processor means from said micro-instruction decoding means to initiate start of a next one of said sequences of micro-instructions of a next one of said second certain of said first certain of said computer instructions;

(B) enabling said instruction register means responsive to said first certain of said control signals from said micro-instruction decoding means to receive from said memory bus means and hold in said instruction register said next one of said second certain of said first certain of said computer instructions;

(C) enabling said controllable connection means responsive to first certain of said control signals from said micro-instruction decoding means to provide said first certain of said memory output signals representing said portions of said next one of said second certain of said first certain of said computer instructions to said buffer means from said memory bus means;

(D) enabling said buffer means responsive to said first certain of said control signals from said micro-instruction decoding means to (1) receive said first certain of said memory output signals from said controllable connection means and (2) to hold in said buffer means said portions of said next one of said second certain of said first certain of said computer instructions from said memory bus means,

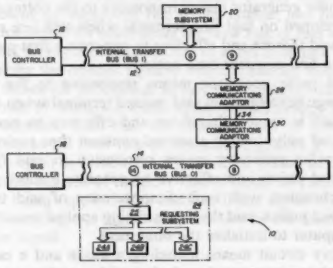
so that the initial micro-instruction of said next one of said sequences of micro-instructions is provided to said buffer means directly from said memory bus means.

4,205,373

SYSTEM AND METHOD FOR ACCESSING MEMORY CONNECTED TO DIFFERENT BUS AND REQUESTING SUBSYSTEM

Niranjan S. Shah, and James F. Taylor, both of Escondido, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed May 22, 1978, Ser. No. 908,183
Int. Cl.[2] G06F *13/00, 3/04*
U.S. Cl. 364—200 **16 Claims**



1. In a data processing system including first and second busses each having a plurality of addressable ports, a system comprising in combination:

(a) a memory subsystem connected to a first port of said second bus;

(b) a subsystem connected to a second port of said first bus, said subsystem including

i. a plurality of input/output means for transmitting a request message to said first bus;

ii. means for inserting first identification information into said request message, representing a one of said input-/output means from which said request message is transmitted;

(c) means coupled to said first and second busses, respectively, for routing said request message from said first bus to said second bus and routing any memory response message produced in response to said request message by said memory subsystem from said second bus to said first bus, said routing means including

i. means for receiving said request message from said first bus and determining if said request message requires a response from said memory subsystem;

ii. means for temporarily storing said first identification information;

iii. means responsive to said request message receiving means for modifying said request message to contain second identification information representing an addressable port on said second bus and the location of said stored first identification information in said means for temporarily storing;

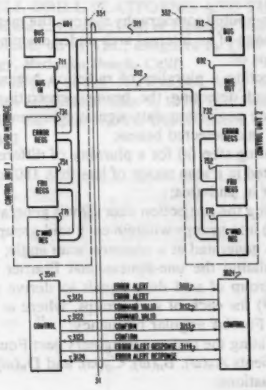
iv. means for transmitting said modified request message to said memory subsystem via said second bus.

4,205,374

METHOD AND MEANS FOR CPU RECOVERY OF NON-LOGGED DATA FROM A STORAGE SUBSYSTEM SUBJECT TO SELECTIVE RESETS

Henry Bardsley, III, Saratoga; Fernando A. Luiz, Monte Sereno, both of Calif.; Nils F. Nilsen, Tucson, Ariz., and Ronald C. Simpson, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1978, Ser. No. 953,063
Int. Cl.[2] G06F *11/00, 13/00*
U.S. Cl. 364—200 **6 Claims**



1. A method for the automatic recovery of data from a defaulting one of a pair of failure independent control units, each control unit having means for switchably interconnecting channel to device interfaces, means for the registration of its error state, and a control unit/control unit communications interface, each interface being of the asynchronous demand-/response type, the method steps comprising:

notifying a channel accessing the defaulting control unit of its unavailability responsive to a trouble signal originating within said defaulting control unit concurrent with notifying the companion control unit of this status;

peer coupling data from the defaulting control unit to a channel interface coupling the companion control unit through and under the control of the companion control unit over the communications interface responsive to the unavailability status indication; and

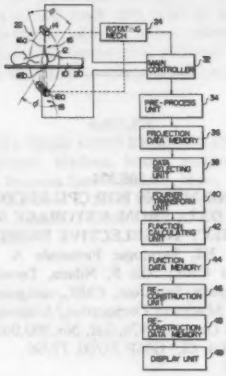
buffering any accessing channel response at the defaulting control unit to the unavailability notification until said data has been offloaded subsequent to which the channel response may be executed.

4,205,375

METHOD AND APPARATUS FOR PERFORMING COMPUTED TOMOGRAPHY

Tamon Inouye, Tokyo, and Hiroyuki Mizutani, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 31, 1978, Ser. No. 874,065
Claims priority, application Japan, Jan. 31, 1977, 52-8703
Int. Cl.[2] G01N *23/00*
U.S. Cl. 364—414 **4 Claims**



1. In a computed tomography system, the method for generating an image of an internal area under examination comprising the steps of:

(a) projecting a plurality of radiation beams through said area and detecting the beams penetrating said area to generate projection data signals representing the intensities of said detected beams;

(b) repeating step (a) for a plurality of different scan angles θ located in a scan sector of less than 180° centered about a point in said area;

(c) dividing the projection data signals generated in steps (a) and (b) into groups wherein each said group includes data signals generated at a common scan angle;

(d) calculating the one-dimensional Fourier transform for each group of said data signals to derive sample values $G_1(\omega,\theta)$ for each of said groups, where ω is a predetermined Fourier angular frequency;

(e) calculating the real and imaginary part Fourier transform coefficients $A_n(\omega)$, $B_n(\omega)$, $C_n(\omega)$, and $D_n(\omega)$ according to the equations:

$$ReG(\omega,\theta) = \sum_{n=0}^{N} [A_n(\omega)\mathrm{Cos}2n\theta + B_n(\omega)\mathrm{Sin}2n\theta]$$

$$ImG(\omega,\theta) = \sum_{n=0}^{N} [C_n(\omega)\mathrm{Cos}(2n+1)\theta + D_n(\omega)\mathrm{Sin}(2n+1)\theta]$$

by substituting into said equations the real and imaginary part sample values corresponding to the $G_1(\omega,\theta)$ values obtained in step (d) and the values of the scan angles θ within said scan sector and solving the multiple equations so constructed for $A_n(\omega)$, $B_n(\omega)$, $C_n(\omega)$ and $D_n(\omega)$;

(f) utilizing the equations of step (e) with the calculated values of said Fourier transform coefficients and values of scan angles θ outside of said scan sector to calculate a plurality of one-dimensional Fourier transform sample values $G_2(\omega,\theta)$ for scan angles θ outside of said scan sector;

(g) determining absorption coefficient values for a plurality of points within said internal area under examination based on said Fourier transform sample values $G_1(\omega,\theta)$ and $G_2(\omega,\theta)$; and

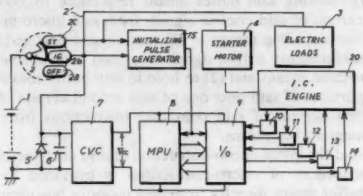
(h) displaying said absorption coefficient values in a two-dimensional plot to construct an image of said internal area.

4,205,376

METHOD AND APPARATUS FOR INITIALIZING VEHICLE-MOUNTED COMPUTERS

Matuju Yoshida, Bisai, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 2, 1978, Ser. No. 882,923
Claims priority, application Japan, Apr. 15, 1977, 52-43956
Int. Cl.[2] H03K *5/13*; G06F *15/20*
U.S. Cl. 364—424 **4 Claims**



1. In a vehicle control system having an engine, a battery, a starter motor adapted to crank said engine with the electric power supplied thereto, a digital computer programmed to be initialized and perform calculations required for vehicle controls according to a preestablished operating sequence with the electric power supplied thereto, and a key switch connected to said battery and movable to a first terminal for supplying said digital computer with the electric power and to a second terminal for supplying said digital computer and said starter motor with the electric power, an initializing apparatus comprising:

first pulse generator means responsive to the voltage change developed on said first terminal when said key switch is moved thereto and effective to generate a first pulse having a first constant time period;

second pulse generator means responsive to the voltage change developed on said second terminal when said key switch is moved therefrom and effective to generate a second pulse having a second constant time period;

third pulse generator means responsive to said first and second pulses and effective to generate a third pulse in synchronism with each disappearance of said first and second pulses, said third pulse being applied to said digital computer to initialize the same; and

a battery circuit means including a diode and a capacitor which are connected such that said capacitor is charged by said battery through said diode with said key switch being moved to said first and second terminals and supplies said three pulse generator means with the electric power therefrom.

4. In a vehicle control system having an engine, a battery, a starter motor adapted to crank the engine with the electric power supplied thereto, a digital computer programmed to be initialized and perform calculations required for vehicle controls according to a pre-established operating sequence with the electric power supplied thereto, and a key switch connected to the battery and movable to a first terminal for supplying the digital computer with the electric power and to a second terminal for supplying the digital computer and the starter motor with the electric power, an initializing method comprising the steps of:

automatically generating a first pulse having a first constant time period responsive to the voltage change developed on the first terminal when the key switch is moved thereto;

automatically generating a second pulse having a second constant time period responsive to the voltage change developed on the second terminal when the key switch is moved therefrom;

automatically generating a third pulse responsive to the first and second pulses and in synchronism with each disappearance of the first and second pulses, the third pulse being applied to the digital computer to initialize the same.

4,205,377

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

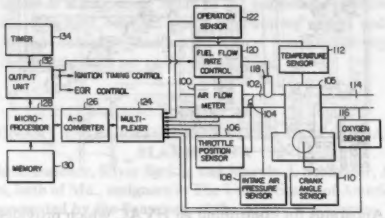
Yoshishige Oyama; Teruo Yamauchi, and Yutaka Nishimura, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 24, 1978, Ser. No. 899,159

Claims priority, application Japan, Apr. 22, 1977, 52-45795

Int. Cl.[2] **G06F** *15/20;* **G02D** *33/00*

U.S. Cl. 364—431 **11 Claims**



1. A control system for an internal combustion engine comprising: an air flow meter for metering the flow rate of intake air supplied to the engine and for producing an output signal relative to the flow rate of intake air; a plurality of sensors for detecting different conditions of engine operation; a microprocessor for carrying out digital computation on the basis of the output signal of said air flow meter and the output signals of said sensors thereby providing a plurality of control signals for controlling the controlled variables of the engine; fuel supply means for supplying fuel to the engine; and fuel flow rate control means for controlling the flow rate of fuel supplied by said fuel supply means according to a fuel flow rate control signal among the control signals; wherein said air flow meter includes means for producing, as said output signal relative to the flow rate of intake air, a non-linear signal having a non-linear characteristic such that the changing rate of said signal with respect to the flow rate of intake air is greater in a predetermined region in which the flow rate of intake air is small than in other regions of the flow rate of intake air, said microprocessor being supplied with said non-linear signal in a digital form for carrying out digital computation on the basis of said non-linear signal.

4,205,378

INTERNAL COMBUSTION ENGINE FUEL CONTROL SYSTEM

Peter J. Ward, Hampton in Arden, England, assignor to Lucas Industries Limited, Birmingham, England

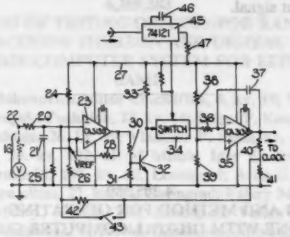
Filed Jun. 12, 1978, Ser. No. 914,454

Claims priority, application United Kingdom, Jun. 23, 1977, 26295/77

Int. Cl.[2] **F02D** *35/00;* **F02B** *75/10*

U.S. Cl. 364—431 **7 Claims**

1. An internal combustion engine fuel control system comprising an exhaust gas composition sensing device having a high output impedance at low temperature, but producing when at operating temperature, a voltage signal related to the exhaust gas composition and a fuel control circuit to which said sensing device is connected so that variations in the voltage signal therefrom vary the fuel flow to the engine so as to cause the voltage signal to approach a desired level, said fuel control circuit including an input stage connected to the sensor and to a reference voltage source such that the output of said input stage is dependent on the relative levels of the signal voltage and the reference voltage, an integrator stage connected to the output of the input stage and producing an output which changes relatively slowly as a result of changes in the output of the input stage, the output of the integrator stage determining the rate at which fuel is supplied to the engine and a high impedance negative feedback circuit connecting the output of the integrator stage to an input terminal of the input



stage and including a high impedance feedback path of impedance less than that of the sensing device at low temperature and higher than that of the sensing device at operating temperature, said feedback circuit causing the output of the integrator to approach a desired value when the sensing device is at low temperature.

4,205,379

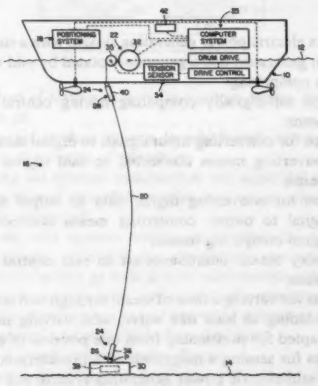
POSITION DETERMINING AND DYNAMIC POSITIONING METHOD AND SYSTEM FOR FLOATING MARINE WELL DRILL PLATFORMS AND THE LIKE

Marvin Fox; Donald L. Cooper, both of Houston, and Walter B. Warren, Seabrook, all of Tex., assignors to TRW Inc., Systems & Energy, Redondo Beach, Calif.

Continuation-in-part of Ser. No. 796,944, May 16, 1977, abandoned. This application May 9, 1978, Ser. No. 904,359

Int. Cl.[2] **G06F** *15/20;* **B63H** *15/00*

U.S. Cl. 364—432 **18 Claims**



1. A system for determining the relative horizontal positions of the upper and lower ends of a flexible connecting line suspended from a floating marine platform, and wherein the length of said line is many orders of magnitude greater than the relative horizontal displacement of the connecting line ends, said system comprising:

angle sensing means including upper and lower connecting line angle sensors for producing angle signals representing the vertical slope angles and azimuth angles of the upper and lower ends of said connecting line,

signal processing means for combining said angle signals in

accordance with a predetermined relationship of said slope angles which compensates for phase difference between the sensor outputs due to the propagation time of stress waves through said line to provide an output signal representing said relative horizontal positions, and

a positioning system adapted to correct said relative horizontal displacement of said platform in response to said output signal.

4,205,380

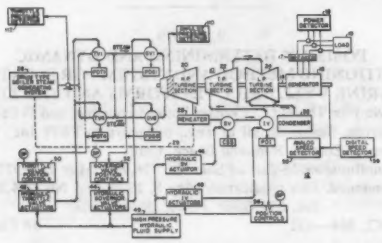
SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH DIGITAL COMPUTER CONTROL WITH ACCELERATING SETPOINT CHANGE

Andrew Braytenbah, Pennsauken, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 247,850, Apr. 26, 1972, abandoned. This application Aug. 10, 1973, Ser. No. 387,582

Int. Cl.[2] F01D *17/02;* **H02P** *9/04;* **G05B** *15/00*

U.S. Cl. 364—494 **5 Claims**



1. An electric power generating system with a steam turbine, a steam generator, and a generator rotated by said turbine, said system comprising:

means for digitally computing having central processing means;

means for converting input signals to digital data, said input converting means connected to said digital computing means;

means for converting digital data to output signals, said digital to output converting means connected to said digital computing means;

memory means interconnected to said central processing means;

means for valving a flow of steam through said steam turbine including at least one valve, said valving means being adapted for positioning from one position to another;

means for sensing a magnitude of a predetermined variable of said electric power generating system, and means connecting said sensing means with said input signal converting means;

means connecting said output converting means to said valving means;

said digital computing means and said valving means in combination being characterized by having

i. means for limiting said valving means at a predetermined position limit;

ii. means for changing said valve position limit at a predetermined nonlinear rate; and

means for manually inputting rate data to said digital computing means for controlling said predetermined rate.

4,205,381

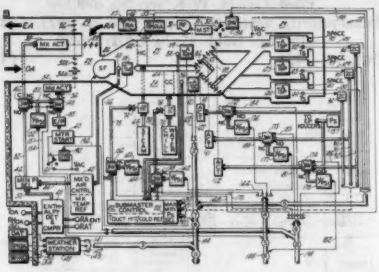
ENERGY CONSERVATIVE CONTROL OF HEATING, VENTILATING, AND AIR CONDITIONING (HVAC) SYSTEMS

John E. Games, Granby; William W. Bitterli, Simsbury, both of Conn., and David M. Healey, Feeding Hills, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 31, 1977, Ser. No. 829,379

Int. Cl.[2] F24F *3/00;* **G06F** *15/46*

U.S. Cl. 364—505 **6 Claims**



1. Apparatus for controlling an HVAC which provides hot and cold discharge air to a plurality of temperature controlled spaces through associated hot and cold decks connected to an air handler source, each space selecting a portion of the hot and cold air by position modulation of space dampers from a full hot air to a full cold air position in dependence on a selectable reference temperature associated with the space, the air handler including a heating source and cooling source which provide the hot and cold discharge air by conditioning the mixed air discharge from a mixed air source provided as a mixture of outside air and return air from the spaces in a ratio determined by the position of mixed air dampers included therein, the apparatus comprising:

plurality of source temperature sensor means, disposed in the HVAC air handler source, for providing sensed signal information including an actual hot air discharge temperature signal and an actual cold air discharge temperature signal;

plurality of space temperature sensor means, one each disposed in each of the temperature controlled spaces, for providing an actual space temperature signal;

plurality of source control means, including a heating source control means and a cooling source control means, each operatively connected to the associated source and each responsive to actuating gate signals, actual discharge temperature signals and deck reference temperature signals presented thereto, said plurality of source control means each providing a turn on of the source associated therewith in response to the presence of said gate signal, and each providing regulation of the discharge air temperature from the source associated therewith in dependence on the difference temperature between said actual discharge temperature signals and said deck reference temperature signals; and

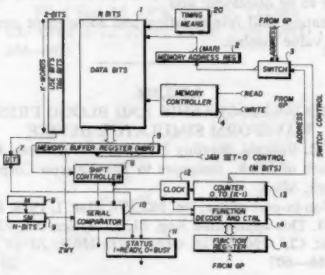
electronic processing means, connected to said plurality of source control means and responsive to said actual space temperature signals, said processing means comparing each of said actual space temperature signals to the lower limit and upper limit of a temperature drift band defined, respectively, by a heat set point temperature signal and a cool set point temperature signal stored in a memory portion of said processing means, said processing means providing to said cooling source control means an actuating gate signal and a cold deck reference temperature signal in response to an actual space temperature above said cool set point temperature and providing to said heating source control means an actuating gate signal and

a hot deck reference temperature signal in response to an actual space temperature below said heat set point temperature, said cold deck reference temperature signal and said hot deck reference temperature signal each having a magnitude in dependence on the product of a proportional plus integral gain signal stored in said memory multiplied by an associated one of a space hot temperature error signal and a space cold temperature error signal respectively, said processing means providing said space hot temperature error signal at a magnitude equal to the temperature difference between said cool set point temperature signal and the highest value of said actual space temperature signals above said cool set point, said processing means providing said space cold temperature error signal at a magnitude equal to the temperature difference between said heat set point temperature signal and the lowest value of said actual space temperature signals below said heat set point temperature.

4,205,382
BINARY INTEGRATOR FOR FIXED CELL RADAR ALARM DATA

David J. Buscher, Silver Spring, and Marvin J. Schneider, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 2, 1979, Ser. No. 8,808
Int. Cl.[2] G01S 9/44
U.S. Cl. 364—516 **3 Claims**



1. A method of determining whether M cell alarms have occurred in the last N processing times over an area of K cells, where $M \leqq N$, comprising,

providing a memory which is N bits wide by K words long, said bits corresponding to the last N processing times and said words corresponding to said K cells, each of said K words in said memory having a tag bit associated therewith,

defining N successive processing intervals,

responsive to the occurrence of a cell alarm or alarms in one of said N processing intervals, placing a binary 1 in the end-most bit of each word which corresponds to a cell in which an alarm has occurred and shifting all information in the word one bit position in the direction away from said end-most bit,

during the interval in which said alarm or alarms have occurred, setting the tag bit associated with each word which has a binary 1 in said end-most bit,

determining which of said tag bits are set at the end of each processing interval,

inserting binary 0's in the end-most bits and shifting all information in the word one bit position in the direction away from said end-most bit of each word which has a tag bit associated therewith which is not set,

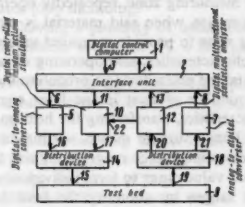
determining which of said words include at least M binary 1's and

storing the addresses of said words which have at least M binary 1's.

4,205,383
METHOD OF TESTING OBJECTS FOR RANDOM ACTIONS THEREON AND DIGITAL SIMULATOR-COMPUTER SYSTEM FOR EFFECTING SAME

Eduard A. Bakanovich, ulitsa Chicherina, 4, kv. 19; Mikhail A. Orlov, prospekt Pushkina, 23, kv. 14; Sergei F. Kostjuk, ulitsa Mayakovskogo, 26, kv. 19; Vladimir P. Shmerko, ulitsa Tikhotskogo, 26, kv. 102, all of Minsk; Igor E. Gagen, Moskovsky prospekt, 189, kv. 60, Leningrad; Aron G. Gringlaz, Prazhskaya ulitsa, 27, kv. 17, Leningrad; Valery M. Kulakov, prospekt Slavy, 37, kv. 261, Leningrad; Valery B. Lysov, ulitsa Sevastianova, 4, kv. 41, Leningrad; Alexandr V. Menkov, Slobodskoi pereulok, 6-a, kv. 58, Moscow; Nikolai I. Pikin, ulitsa Goletiana, 26, kv. 24, Leningrad; Vladimir N. Chetverikov, ulitsa Malaya Bronnaya, 31/13, kv. 48, Moscow; Nikolai I. Melnik, ulitsa Lomonosova, 4, kv. 27, Minsk; Vladimir I. Novikov, ulitsa Karbysheva, 9, kv. 150, Minsk; Alexandr N. Popov, Partizansky prospekt, 105, kv. 24, Minsk, and Evgeny A. Yakushenko, ulitsa Leni Golikova, 94, kv. 58, Leningrad, all of U.S.S.R.

Filed Nov. 13, 1978, Ser. No. 959,422
Int. Cl.[2] G06F 15/36
U.S. Cl. 364—554 **39 Claims**



1. A method of testing objects for random action, comprising the steps of:

recording said random actions, to which said object is subjected in the course of operation;

determining the spectral composition and statistical characteristics of said recorded random actions, to which said object is subjected;

reproducing said random actions as a simulating random pulse process, wherein the amplitudes, durations and polarities of pulses, as well as intervals between pulses, are random parameters with predetermined probability characteristics approximate to said recorded actions as regards their spectral and statistical characteristics;

selecting a combination of pulse shapes;

forming said simulating random pulse process as a train of pulses of different shapes from the preselected combination of pulse shapes;

forming statistically independent random parameters of said pulses;

applying said reproduced random actions to said object;

analyzing said spectral and statistical characteristics of said reproduced random actions and the response of said objects to these actions to obtain data for calculating the parameters for correcting the spectral and statistical characteristics of the simulating random pulse process; and

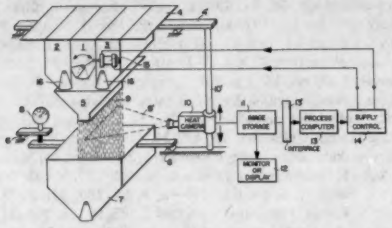
correcting said spectral and statistical characteristics of the simulating random pulse process by varying its probability characteristics.

4,205,384

METHOD FOR THE ANALYTIC DETERMINATION OF PHYSICAL CHARACTERISTICS OF A MATERIAL

Georg Merz, Gedern-Wenings, and Heinz Gehrmann, Biebergemuend-Bieber, both of Fed. Rep. of Germany, assignors to WIBAU GmbH, Gruendau-Rothenbergen, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 937,959
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1977, 2741321
Int. Cl.[2] G01N *33/16*
U.S. Cl. 364—555 11 Claims



1. A method for the analytic determination of physical characteristics of a material, comprising the following steps: establishing a measuring zone, moving said material through said measuring zone, training sensor means in the form of heat image camera means for measuring said physical characteristics, onto said measuring zone, repeatedly operating said heat image camera means when said material is moving through said measuring zone to provide measured values representing said physical characteristics, said operating of said heat image camera means taking place during a predetermined time period to provide a number of heat image lines representing said physical characteristics, transferring the heat image lines onto a screen type image storage means, sorting said heat image lines into predetermined value ranges, summing the heat image lines within each value range to form individual sum values for the respective ranges by counting the heat image lines in groups whereby the groups are formed by coherent image lines for evaluation, and sorting the individual range sum values in a retrievable manner for display or evaluation.

4,205,385

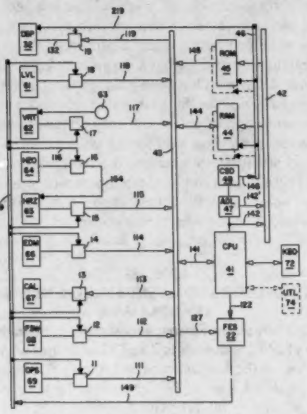
ELECTRONIC SURVEYING SYSTEM

Kent E. Erickson, Brookside; Stefan Orsen, Jersey City, and Gerhardt C. Rowe, Flemington, all of N.J., assignors to Keuffel & Esser Company, Morristown, N.J.

Division of Ser. No. 810,241, Jun. 27, 1977, Pat. No. 4,146,927.
This application Sep. 27, 1978, Ser. No. 946,239
Int. Cl.[2] G01B *11/26*
U.S. Cl. 364—560 1 Claim

1. In the operation of a surveying system comprising a surveying instrument including an alidade and generating electronic data indicative of angular displacement of the line of sight in said alidade, electronic distance measuring means for providing data indicative of the displacement along the line of sight between said surveying instrument and a target under observation, level sensing means for providing electronic data indicative of the angular displacement of the spindle axis of said surveying instrument alidade from a vertical disposition, calculating means for processing said displacement data to determine the values of the extent of said displacements and vectors thereof, switching means for providing electronic data indicative of the selection of any one of the plurality of said displacements and vectors, and display means for presenting in digital form the value of the selected one of said plurality, the method which comprises operating computer means to atuomatically perform the steps of:

(a) interrogating said switching means to identify the selected one of said plurality;
(b) gathering those of said data relevant to the determination of the value of said selected one of said plurality;
(c) calculating said value;



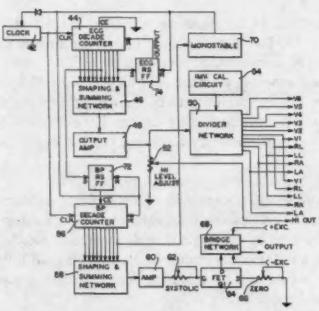
(d) directing to said display means data indicative of said value to be displayed; and
(e) repeating said interrogating and subsequent steps after each value display.

4,205,386

ELECTROCARDIOGRAPHIC AND BLOOD PRESSURE WAVEFORM SIMULATOR DEVICE

Frederick B. Ruszala, Sterling Heights, and Kenneth J. Cook, Troy, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Continuation-in-part of Ser. No. 882,357, Mar. 1, 1978, Pat. No. 4,204,261. This application Aug. 31, 1978, Ser. No. 938,430
Int. Cl.[2] G06G *7/26;* G06J *1/00;* H01C *10/46*
U.S. Cl. 364—607 25 Claims



11. Apparatus for simulating electrocardiographic and blood pressure waveforms utilized to check the operability of an electrocardiogram machine and a blood pressure monitor, respectively, said apparatus comprising:
first generator means for providing a simulated electrocardiographic waveform segments;
second generator means for providing simulated blood pressure waveforms; and
control means coupled between said first and second generator means for automatically initiating said blood pressure

waveform after a predetermined number of the electrocardiographic waveform segments have been generated so that said electrocardiographic and blood pressure waveforms are provided in a time sequence corresponding to waveforms that would ordinarily be supplied by a live patient.

20. An interconnection device for interconnecting a blood pressure monitor and a blood pressure waveform simulator device, with said blood pressure monitor providing an excitation signal and including means for receiving an input signal, said interconnecting device comprising:

a cable having a plurality of conductors;

a first connector means on one end of said cable having terminals for coupling said conductors to the blood pressure monitor;

a second connector means at the other end of the cable having terminals for coupling said conductors to said simulator device; and

a plurality of resistors having first and second end portions, the first end portions of the resistors being commonly connected to one of the conductors for supplying the excitation signal from blood pressure monitor to the simulator device, the other end portions of the resistors each being coupled to a separate terminal in one of said connectors to provide alternative conductive paths from the blood pressure monitor to said simulator device.

4,205,387

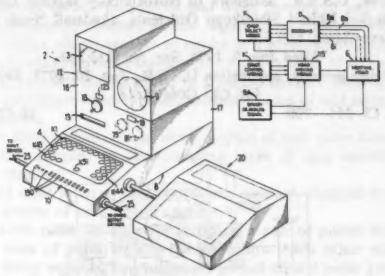
DATA STORAGE AND RETRIEVAL SYSTEM

Stanford R. Ovshinsky, Bloomfield Hills; Peter H. Klose, and Wayne P. Messing, both of Troy, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sep. 16, 1976, Ser. No. 724,084

Int. Cl.[2] G06F *3/12, 15/40;* **H05B** *1/00;* **G01D** *15/10*

U.S. Cl. 364—900 **34 Claims**



1. A system for producing microform records comprising, in combination: a source of electrical signals representing information to be recorded; heat producing means to be responsive to said signals and having at least one current-carrying point for producing a Joule heating of an adjacent record medium, each of said current-carrying points being individually selectively energizable and having dimensions of no greater than about 20 micron; an initially opaque or transparent dry process microform film supported adjacent to said heat producing means and including a layer of imaging material which is sensitive to and is imaged and developed by Joule heating internally produced or externally applied to its surface at selected points thereof to produce a pattern of light transparent or opaque areas corresponding to the heated portions thereof, wherein visible light can be projected through transparent areas of the film readily to project an image corresponding to said pattern, the flow of current of at least a given value through any one of said current-carrying points producing substantially instantaneously a transparent or opaque dot image in said layer of imaging material of a size of the order of magnitude of the dimension of the current-carrying point which produced the same; and positioning and image-forming means responsive to said source of electrical signals for moving one of said heat-producing means and said microform film relative to the other and for effecting the feeding of said current of said given value representing said electrical signals to said current-carrying points of said heat-producing means at selected instants of time to produce a desired record of said signals on said film.

4,205,388

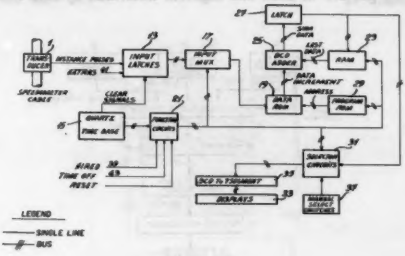
TAXIMETER

Jack Steiner, Laval, Canada, assignor to Centrodyne Corporation, Montreal, Canada

Filed Jul. 18, 1977, Ser. No. 816,296

Int. Cl.[2] G07B *13/10*

U.S. Cl. 364—900 **3 Claims**



1. A processor for an electronic taximeter comprising:

(A) a computer loop including:

(1) a RAM having a plurality of updatable data storage locations therein accessible by a like plurality of addresses;

(2) a DATA ROM having a plurality of preset data storage locations therein accessible by a like plurality of addresses;

(3) a BCD adder receiving inputs from both said RAM and said DATA ROM to add the contents of predetermined storage locations of both;

(4) a PROGRAM ROM whose output is fed to said DATA ROM; and

(5) a latch receiving the output of said BCD adder and feeding an input of said RAM to thereby update said RAM with updated data from said BCD adder;

(B) input multiplexer means fed to said DATA ROM;

(C) means for addressing said RAM, said PROGRAM ROM, and cycling said input multiplexer means, said means comprising;

(1) clock means; and

(2) electronic counter means; and

(D) function circuit means including said counter and connected to said clock means for signalling taximeter functions such as HIRED and TIME OFF;

wherein, all calculations are performed in said computer loop.

4,205,389

APPARATUS FOR GENERATING A RASTER IMAGE FROM LINE SEGMENTS

Robert A. Heartz, Deland, Fla., assignor to General Electric Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 726,304, Sep. 24, 1976, abandoned. This application Mar. 15, 1978, Ser. No. 886,974

Int. Cl.[2] G06F *3/14*

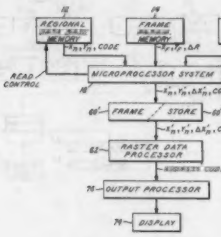
U.S. Cl. 364—900 **4 Claims**

1. A digital display generator of the type wherein data, including stored data words describing characteristics of line segments utilizable to construct a predefined image, is processed to produce a digital control signal employed to effect presentation of a selected portion of said image on a raster

display, said line segments including line vectors representative of elongated features of said image and boundary vectors identifying boundaries between image areas of different brightness, each of said data words including X,Y coordinate data for defining the location of the end points of one of said line segments and a code defining either the intensity of said line segment if it is a line vector, or the brightness of the image areas on opposite sides of said line segment if it is a boundary vector, said generator comprising:

(a) a decision unit for selecting all of said stored data words describing line segments having an end point within said selected portion of the image;

(b) a processor unit for performing predefined macrosteps, including arithmetic manipulations on the data words selected by the decision unit, said manipulations including determining the change ΔX of X, where ΔX is the change per ΔY of each line segment described by said detected



data words and where ΔY is the distance between adjacent raster lines;

(c) a frame memory for storing said selected data words and data representative of ΔX determined by said processor unit;

(d) comparator means for reading all data in the frame memory prior to presentation of each raster line by the raster display and detecting all data words in said frame memory which describe line segments intersecting the raster line;

(e) means responsive to the codes included in the detected words to produce the digital control signal; and

(f) updating means adapted to substitute for the the X-coordinate X_n of each of said stored words detected a new value $X_n+\Delta X_n$ to locate the intersection of the line segment described by said word with the raster line to be presented following that on which the intersection occurs at X_n.

4,205,390

ADDRESS CONVERTER

Kiyoshi Sakurai; Tateo Matsumoto, both of Hiratsuka, and Teruo Ishikawa, Yokohama, all of Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 25, 1978, Ser. No. 945,444
Int. Cl.[2] G06F 5/00, 13/00
U.S. Cl. 364—900 **6 Claims**

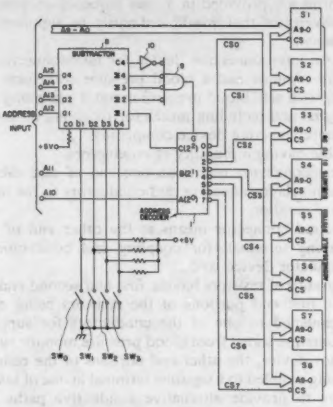
1. An address converter for decoding a multi-bit address comprising:

switching means for selectively supplying binary bit logic signals,

a subtraction circuit means connected to said switching means for subtracting bit information supplied by said switching means from a desired number of the most significant bit information in the address signal input to the subtractor circuit means,

an address-decode circuit means which receives as its input a first and a second output logic signal from said subtraction circuit and the intermediate order bit information in the address signal to produce one of a plurality of output signals as a decoded representation thereof, and

a plurality of system subunits each of which receives a respective output from said address-decode circuit means as



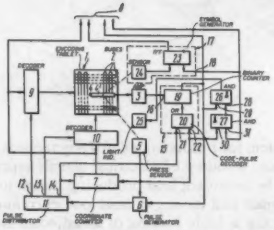
well as all of the remaining least significant bit information to access one of said subunits.

4,205,391

DEVICE FOR ENCODING AND INPUTTING TO COMPUTER ALPHABETIC AND TOPOLOGICALLY REPRESENTED GRAPHIC DATA THAT DESCRIBES, IN PARTICULAR, STRUCTURAL FORMULAE OF CHEMICAL COMPOUNDS

Gennady P. Ulyanov, and Anatoly R. Maslov, both of Novosibirsk, U.S.S.R., assignors to Novosibirsky Institut Organicheskoi Khimii Sibirskogo Otdelenia Akademii Nauk SSR, Novosibirsk, U.S.S.R.

Filed Jun. 9, 1978, Ser. No. 914,213
Claims priority, application U.S.S.R., Jun. 20, 1977, 2497583
Int. Cl.[2] G06F 3/14
U.S. Cl. 364—900 **10 Claims**



1. A device for encoding and inputting to a computer via a computer communication line alphabetic and topologically represented graphic data that describes, in particular, structural formulae of chemical compounds, said device comprising:

an encoding tablet incorporating coordinate buses made in the form of linearly extended induction coils, arranged as a rectangular grid for establishing a flux of electromagnetic energy so as to generate the coordinates of input data;

a coordinate counter having outputs, a counting input and a reset input;

two coordinate decoders each having data inputs and an output;

said outputs of said coordinate counter, coupled to a com-

puter communcation line and to said data inputs of said coordinate decoders;

said outputs of said coordinate decoders, coupled to said coordinate buses of said encoding tablet;

a coordinate pickup having a housing for converting said flux of electromagnetic energy from said coordinate buses of said encoding tablet into electrical signals;

an amplifier disposed within said housing of said coordinate pickup and having an input and an output;

said coordinate pickup coupled to said input of said amplifier;

a pressure sensor disposed in said housing of said coordinate pickup, said pressure sensor having an output;

a pulse generator having a trigger input, a blocking input and an output;

said trigger input of said pulse generator, coupled to said output of said pressure sensor;

a changeable encoding form divided into two zones as follows: a zone in which the topological patterns of graphic input data, of the type including topological patterns of structural formulae of chemical compounds, are encoded, and another zone in which randomly selected data, of the type including names of atoms, structural fragments and various types of interatomic chemical bonds, is encoded; said changeable encoding form having a coordinate grid formed with a preselected spacing interval selected such that there is a sufficient area to accommodate at the adjacent nodal points of said coordinate grid the representations of the elements of graphic input data, which may be the adjacent tie points of structural formulae;

a pulse distributor having an input and a plurality of outputs, said input of said pulse distributor being coupled to said output of said pulse generator to produce successive pulses at three of said plurality of outputs of said pulse distributor, said pulses being time-shifted with respect to one another by a time interval equal to the oscillation period of said pulse ge ierator;

first and second outputs of said three outputs of said pulse distributor, coupled to said inputs of said coordinate decoders which operate to strobe in a given succession the signals from said two outputs of said outputs of said pulse distributor and to excite in a pulsed manner respectively coordinate buses of said coordinate buses of said encoding tablet;

the third output of said three outputs of said pulse distributor, coupled to said counting input of said coordinate counter;

said reset input of said coordinate counter, coupled to said output of said pressure sensor;

a code-pulse decoder for selecting a pair of pulses from a train of input signals, which follow each other with a delay equal to the oscillation period of said pulse generator, and to form a control signal;

an input and an output of said code-pulse decoder, said input being coupled to said output of said amplifier, and said output being coupled to a blocking input of said pulse generator and to said computer communication line;

a beginning-of-line symbol generator disposed within said housing of said coordinate pickup for generating interrelation symbols concerned with the elements of graphic input data, one of said symbols representing a relationship between the tie points of structural formulae of chemical compounds; a data output and a reset input of said beginning-of-line symbol generator, said data output and said reset input being coupled to said computer communication line;

a changeable writing member arranged as part of said pressure sensor and of said beginning-of-line symbol generator and disposed within said housing of said coordinate pickup;

said amplifier, said changeable writing member, said beginning-of-line symbol generator which registers the displacement of said changeable writing member along its longitudinal axis, and said pressure sensor form altogether an electronic writing means which exercises control over the operation of the entire device so that the encoding and inputting to a computer of graphic data is performed concurrently with the representation of this data on said changeable encoding tablet.

4,205,392

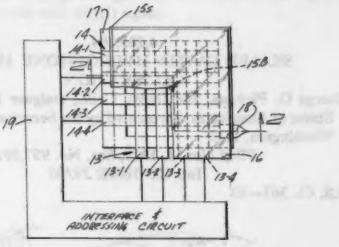
GAS DISCHARGE DISPLAY DEVICE

Bernard W. Byrum, Jr., Toledo; Roger E. Ernsthausen, Luckey, and Michael E. Fein, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 293,555, Sep. 29, 1972, abandoned, which is a division of Ser. No. 210,093, Dec. 20, 1971, abandoned. This application Nov. 10, 1975, Ser. No. 630,587

Int. Cl.² G11C *11/28*

U.S. Cl. 365—116 **29 Claims**



1. In a gas discharge device containing at least two electrodes defining a gas discharge site, at least one of the electrodes being insulated from the gas by a dielectric member, the improvement wherein the gas-contacting surface of at least one dielectric member contains a non-conductive inorganic oxide of at least one transition metal selected from the group consisting of Nb, Ta, Cr, Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Pd, and Pt.

4,205,393

MAGNETIC DOMAIN STORAGE DEVICE

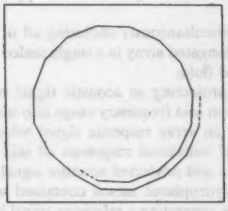
Herbert Henkler, Battenberg; Roland Koenig, Ludwigshafen; Hermann Deichelmann, Ludwigshafen, and Volker Koch, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,057

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712623

Int. Cl.² G11C *19/08*

U.S. Cl. 365—133 **5 Claims**



1. A magnetic domain storage device comprising

(a) a ferromagnetic, polycrystalline metal layer which is applied to a support and comprises areas of different coercivity, the areas of lower coercivity in the form of strip-

shaped channels being surrounded by areas of higher coercivity,

(b) a system of electrical conductors, extending in planes arranged parallel and in close vicinity to the support, for creating, propagating and detecting magnetic domains in the channels of low coercivity, and

(c) a baseplate with electrical connections,

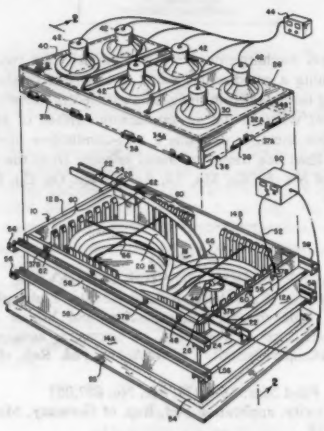
the areas of lower coercivity being in the form of channels which follow a quasi-spiral path on the support, with one end adjacent to the center of the support and the other end adjacent to a corner of the support and executing at least one full 360° turn.

4,205,394

SEALED CAVITY HYDROPHONE ARRAY CALIBRATION

George O. Pickens, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,391
Int. Cl.² H04R *29/00*
U.S. Cl. 367—13 **12 Claims**



1. Apparatus for calibrating an elongated array of electrically interconnected hydrophones over a range of acoustic signal frequencies having lower and upper frequency limits comprising:

means for simultaneously enclosing all of the hydrophones of said elongated array in a single sealed cavity containing a selected fluid;

means for projecting an acoustic signal of a frequency selected from said frequency range into said sealed cavity to generate an array response signal which represents the combined individual responses of said enclosed hydrophones to said projected acoustic signal;

reference hydrophone means contained within said sealed cavity for generating a reference signal in response to said projected acoustic signal; and

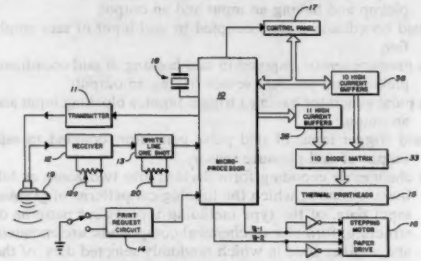
means coupled to said reference hydrophone means for enabling a selected characteristic of said reference signal to be compared with the same characteristic of said array response signal.

4,205,395

DEPTH RECORDER

Edward J. Shortridge, Coral Gables, Fla., assignor to Shakespeare Marine Electronics, Inc., Miami, Fla.

Filed Nov. 8, 1978, Ser. No. 958,743
Int. Cl.² G01S *9/70, 7/60*
U.S. Cl. 367—115 **7 Claims**



1. An aquatic depth recorder system comprising, in combination, means for producing high frequency sound impulses and periodically transmitting said impulses through the water at predetermined time intervals, means for receiving high frequency sound impulses (echoes) reflected from a number of reflecting objects, means for producing return signals which are each coincident in time to one of said high frequency sound impulses, means for producing a predetermined clock frequency, thermally-sensitive paper strip chart recorder means, said strip chart recorder means comprising a plurality of heat-producing resistors arranged in a straight line transversely of the direction of movement of strip chart paper to be recorded on, electrical current drive means for selectively energizing said heat-producing resistors, said thermally-sensitive paper strip chart recorder means comprising drive means for stepwisely advancing the strip chart paper, a microprocessor, manually adjustable function control means for said microprocessor, said microprocessor being programmed: (a) to key the periodic transmission of said high frequency sound impulses producing means, (b) measure the time elapsed between the transmission of the high frequency sound impulse and the reception of the reflected sound impulse (echo), (c) store such elapsed time in memory, (d) decode such time intervals into printing format, (e) read said manual function control means, (f) control the energization of said strip chart paper step-wise drive means and, (g) to selectively activate said electrical current drive means for said heat-producing resistors, all at a rate related to said clock frequency, for periodically printing values of said return signals on said strip chart paper between said step-wise movements thereof, said plurality of heat-producing resistors comprising ten groups of eleven heat-producing resistors each, and said electrical drive means for selectively energizing said heat-producing resistors comprising multiplexed individual resistor group and individual group resistor signal pathways.

4,205,396

AUTOMATIC DIFAR CARDIOID FORMER

Cabell N. Pryor, Jr., Silver Spring, Md., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 565,291
Int. Cl.² G01S *3/80*
U.S. Cl. 367—125 **2 Claims**

1. An automatic cardioid former comprising:

a signal source;

a first hydrophone for detecting directional signal $f_1(t)$ of said signal source;

a second hydrophone for detecting directional signal $f_2(t)$ of said signal source, said $f_2(t)$ signal perpendicular to $f_1(t)$;

a third hydrophone for detecting omnidirectional signal $f_0(t)$ of said signal source;

means for summing $f_0(t)$ with signal $a_1f_1(t)$ and $a_2f_2(t)$ to provide a signal $f_c(t)$, wherein a_1 and a_2 are gain constants;

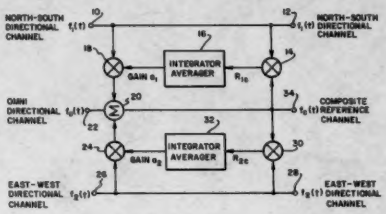
means for multiplying $f_1(t)$ with $f_c(t)$ to provide a first multiplied signal;

means for integrating the average of said first multiplied signal to provide a gain a_1;

means for multiplying said gain a_1 with directional signal $f_1(t)$ to provide said $a_1f_1(t)$ signal;

means for multiplying $f_2(t)$ with $f_c(t)$ to provide a second multiplied signal;

means for integrating the average of said second multiplied signal to provide a gain a_2; and



means for multiplying said gain a_2 with directional signal $f_2(t)$ to provide said $a_2f_2(t)$ signal.

DESIGN PATENTS

GRANTED MAY 27, 1980

ERRATA

For CLASS	See PATENT NO.
D26–035	255,167

DESIGN PATENTS

GRANTED MAY 27, 1980

ERRATA

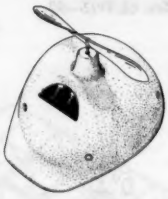
Des. CLASS	Des. PATENT NO.
D218-083	255,167

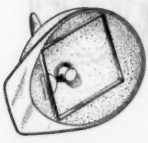
DESIGNS

MAY 27, 1980

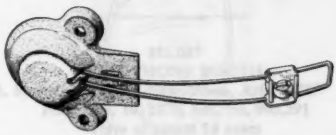
255,056
ATHLETIC PROTECTIVE SHIRT OR SIMILAR ARTICLE
Roger C. Parsons, 1349 S. State St., Hobart, Ind. 46342
Filed Jun. 7, 1978, Ser. No. 913,527
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

255,057
SOLAR CAP
Rees D. Walker, 722 Golfcrest, San Antonio, Tex. 78239
Filed Dec. 19, 1978, Ser. No. 971,068
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—250





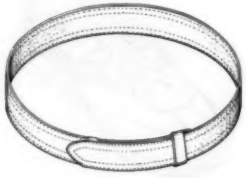
255,058
SUPPORT FOR EAR PROTECTOR
Bo G. Lönnstedt, Kvarnbergsvägen 23, S-141 45 Huddinge, Sweden
Filed Apr. 20, 1978, Ser. No. 898,492
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—259



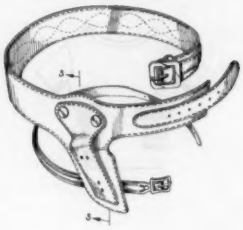
255,059
SIDE PATTERN FOR FOOTWEAR
Thomas J. Riley, Norwell, Mass., assignor to Ry-Co Corporation, Hingham, Mass.
Filed Apr. 14, 1978, Ser. No. 889,887
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

255,060
INSOLE
Kyozo Okazawa, San Francisco, Calif., assignor to Okazawa U.S.A. Inc., San Francisco, Calif.
Filed Aug. 7, 1978, Ser. No. 931,814
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

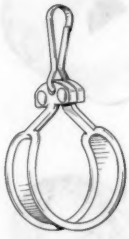
255,061
BUCKLELESS BELT
Richard D. E. Nichols, 813 Cozy Ct., Fallbrook, Calif. 92028
Filed Jan. 7, 1977, Ser. No. 757,643
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—380



255,062
COMPETITION GUN BELT FOR SUPPORTING GUN BOOTS
Ernie H. Hill, and Ernest H. Hill, both of 4547 N. 51st Ave., Phoenix, Ariz. 85031
Filed Feb. 21, 1978, Ser. No. 879,711
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—381



255,063
GOLF BALL HOLDER
Isaac B. Houston, 14 Cachet Parkway, R.R. #1, Unionville, Canada
Filed May 30, 1978, Ser. No. 910,585
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



255,064

COMBINED CARRYING AND RETAINING DEVICE FOR SHOES

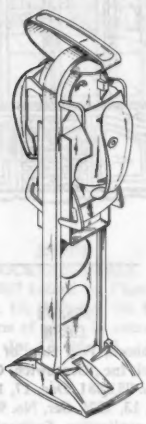
Ivor J. Allsop, 2079 N. Shore Rd., Bellingham, Wash. 98225

Filed Nov. 3, 1977, Ser. No. 848,099

Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D3—36



255,065

COMPARTMENTED TRAY FOR STORING COSMETICS AND THE LIKE

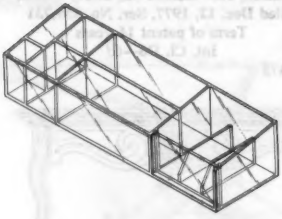
Frank S. Salacuse, 710 Park Ave., New York, N.Y. 10021

Filed Jan. 18, 1978, Ser. No. 4,423

Term of patent 14 years

Int. Cl. D28—*03*

U.S. Cl. D3—39



255,066

COMBINED KEY RING AND CLIP LOCK FOR HOLDING A GAS PUMP TRIGGER IN THE OPEN POSITION

Gregory S. Hadgis, 14078 Zaremba Dr., Brookpark, Ohio 44142

Filed Apr. 23, 1979, Ser. No. 32,717

Term of patent 14 years

Int. Cl. D3—*01;* D6—*08;* D8—*08;* D15—*02;* D23—*01*

U.S. Cl. D3—62

255,067

TELEPHONE BOOTH

Glen H. Furnell, 10112 E. Butte, Mesa, Ariz. 85207

Filed Nov. 16, 1978, Ser. No. 961,391

Term of patent 14 years

Int. Cl. D25—*03*

U.S. Cl. D6—25

255,068

SEAT OR SIMILAR ARTICLE

Robert A. Gera, and Mary Ann Gera, both of Glencoe, Ill., assignors to Kroehler Mfg. Co., Naperville, Ill.

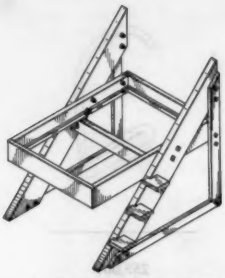
Filed Mar. 24, 1978, Ser. No. 890,090

Term of patent 14 years

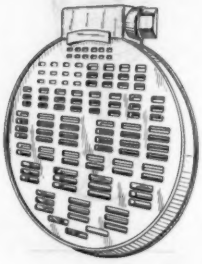
Int. Cl. D6—*01*

U.S. Cl. D6—63

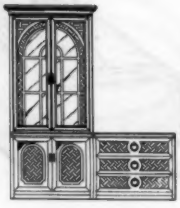
255,069
BEDSTEAD
William J. Wierdo, 801 W. Oakland Park Blvd., Ft. Lauderdale, Fla. 33311
Filed Apr. 8, 1977, Ser. No. 785,853
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—84



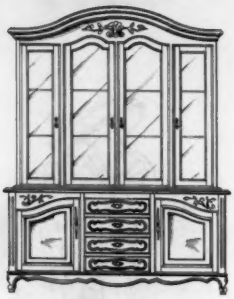
255,070
HOSE CLAMP DISPLAY RACK
Case J. Slaga, Hinsdale, and Douglas Nelson, Broadview, both of Ill., assignors to Advertising Metal Display Co., Chicago, Ill.
Filed Nov. 3, 1977, Ser. No. 848,370
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—114



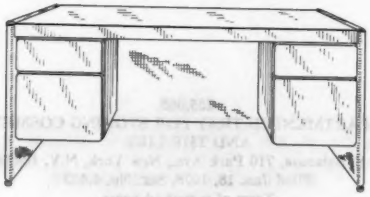
255,071
CABINET OR SIMILAR ARTICLE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,986
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



255,072
BREAKFRONT OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,987
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



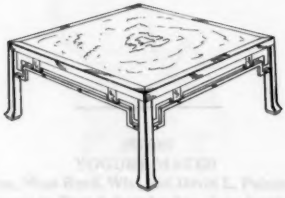
255,073
DESK
Otto W. Zapf, Eschborn, Fed. Rep. of Germany, assignor to Knoll International, Inc., Greenwich, Conn.
Division of Ser. No. 751,881, Dec. 17, 1976. This application Nov. 13, 1978, Ser. No. 960,045
Claims priority, application Switzerland, Jun. 22, 1976, 63313/76
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



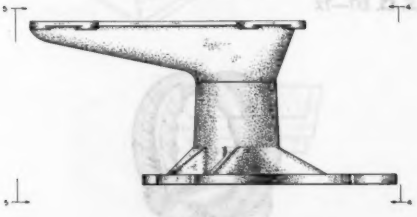
255,074
COCKTAIL TABLE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,731
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

255,075
COCKTAIL TABLE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,978
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

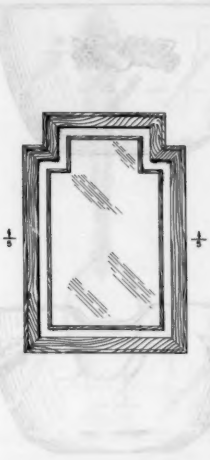
255,076
COCKTAIL TABLE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Dec. 12, 1977, Ser. No. 859,540
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



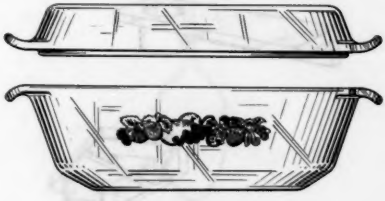
255,077
BASE FOR A VAN SEAT
Luis R. Garza, San Antonio, Tex., and Francis A. Tedesco, Chicago, Ill., assignors to Lifetime Foam Products, Inc., Franklin Park, Ill.
Filed Apr. 6, 1978, Ser. No. 894,232
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



255,078
MIRROR OR THE LIKE
John Van Koert, 190 E. 72nd St., New York, N.Y. 10021
Filed Sep. 23, 1977, Ser. No. 836,195
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—241



255,079
COMBINED DECAL AND GLASS RECEPTACLE
Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Mar. 15, 1976, Ser. No. 666,794
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3



255,080

COMBINED DECAL AND GLASS RECEPTACLE

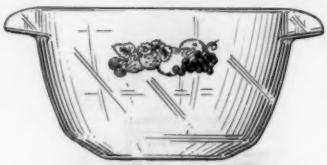
Peter A. Gobleck, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 666,794, Mar. 15, 1976. This application Jul. 17, 1978, Ser. No. 925,414

Term of patent 14 years

Int. Cl. D07—*01*

U.S. Cl. D7—3



255,081

UTILITY TRAY

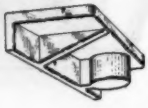
Lorin A. Ramorini, Vallecito, Calif., assignor to Fuzore Manufacturing Co., Inc., Sunnyvale, Calif.

Filed Jun. 17, 1977, Ser. No. 807,426

Term of patent 14 years

Int. Cl. D07—*99*

U.S. Cl. D7—38



255,082

CARVING BOARD

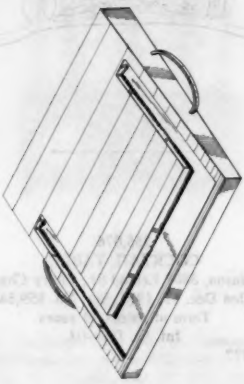
John R. Barrera, 17 Gorham St., Middlebury, Vt. 05753

Filed Mar. 22, 1978, Ser. No. 889,121

Term of patent 14 years

Int. Cl. D07—*04*

U.S. Cl. D7—46



255,083

NAPKIN RING

Gerald P. Kott, New York, N.Y., assignor to Groundworks, Inc., New York, N.Y.

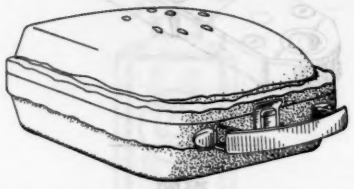
Filed Dec. 29, 1977, Ser. No. 865,720

Term of patent 14 years

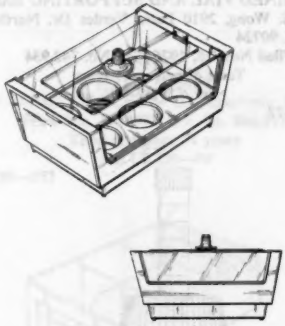
Int. Cl. D7—*06*

U.S. Cl. D7—72

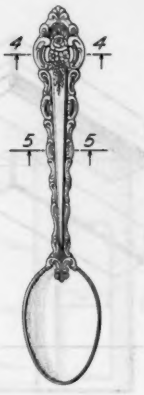
255,084
LUNCHBOX
Ross J. Petrie, Fort Lauderdale, Fla., assignor to Cachet Designs, Inc., Miami, Fla.
Filed Feb. 21, 1978, Ser. No. 879,791
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—76



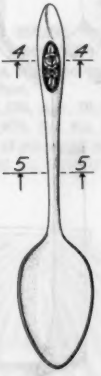
255,085
YOGURT MAKER
John H. Free, West Bend, Wis., and David L. Painter, Glenview, Ill., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 22, 1977, Ser. No. 863,272
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—94



255,086
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 30, 1978, Ser. No. 873,397
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—150



255,087
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Mar. 3, 1978, Ser. No. 883,335
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—150

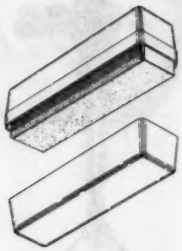


255,088

GRAMOPHONE RECORD CLEANING DEVICE

Philip B. Arbib, Hemel Hempstead, England, assignor to Bib Hi-Fi Accessories Ltd., a British Company of Kelsey House, Hemelo Hempstead, England

Filed Mar. 10, 1978, Ser. No. 886,914
Claims priority, application United Kingdom, Oct. 6, 1977, 981808/77
Term of patent 14 years
Int. Cl. D7—*05;* D4—*01*
U.S. Cl. D7—161



255,089

FLORAL STEM STRIPPER OR SIMILAR ARTICLE

George A. Walker, Middlebury, Conn., assignor to Talley Industries, Inc., Mesa, Ariz.

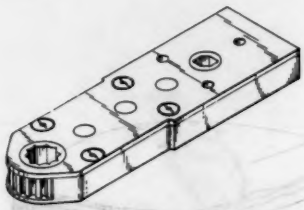
Filed Oct. 12, 1977, Ser. No. 841,641
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—4

255,090

WRENCH

Alfred V. Dacunto, Cheshire, Conn., assignor to Brimatco Corporation, Cheshire, Conn.

Filed Sep. 14, 1977, Ser. No. 833,380
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—21



255,091

HANDLE FOR SCREW DRIVERS OR THE LIKE

Bernhard Kanold, Mikaelivagen 10, S-433 00, Partille, Sweden

Filed May 2, 1977, Ser. No. 793,155
Claims priority, application Sweden, Nov. 5, 1976, 76-2123
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83

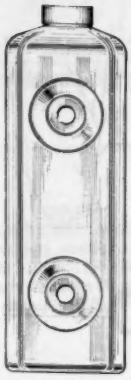
255,092

COMBINED VIAL AND SUPPORTING BASE

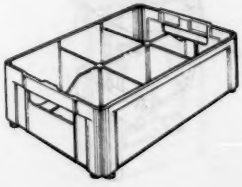
Johnson N. S. Wong, 2910 Palos Verdes Dr. North, Rolling Hills, Calif. 90724

Filed Nov. 18, 1976, Ser. No. 742,934
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12

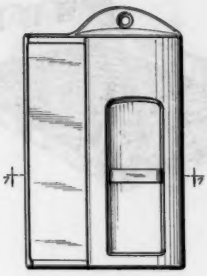
255,093
BOTTLE
Philip F. Hartung, 655 Main St., Greenwich, R.I. 02818, and John J. Tramonti, 142 Smith St., Warwick, R.I. 02886
Filed Jun. 21, 1977, Ser. No. 808,492
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168



255,094
BOTTLE CASE
William V. Wright, 2412 Cloister Dr., Charlotte, N.C. 28204
Filed Jun. 15, 1977, Ser. No. 806,913
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—177

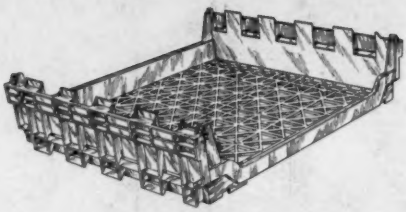


255,095
COMBINED DISPLAY PACKAGE AND ADVERTISING HOLDER
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jun. 25, 1978, Ser. No. 872,014
Term of patent 14 years
Int. Cl. D9—*03;* D20—*02*
U.S. Cl. D9—191



255,096
TAKEOUT FOOD CONTAINER
Doris C. Etelson, Pomona, N.Y., assignor to Howard Johnson Company, Braintree, Mass.
Division of Ser. No. 792,481, Apr. 29, 1977. This application Feb. 5, 1979, Ser. No. 13,451
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

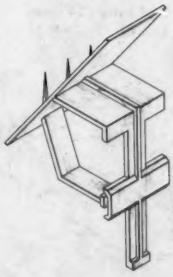
255,097
BAKERY TRAY OR THE LIKE
James C. Carroll, Hopkinsville, Ky., and Lewis T. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 3, 1978, Ser. No. 892,796
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—248



255,098
ACTUATOR CAP FOR PRESSURIZED CONTAINER OR SIMILAR ARTICLE
Thomas H. Hayes, Baton Rouge, La., and Ralph E. Kruck, Clinton, Conn., assignors to Ethyl Products Company, Baton Rouge, La.
Filed Mar. 22, 1978, Ser. No. 889,104
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—258

255,099
DISPLAY CARD HOLDER FOR A NAIL POLISH BOTTLE OR THE LIKE
Robert Borsuk, Old Bridge; Jerry Crandall, Montvale, both of N.J., and David Koslow, New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Oct. 3, 1977, Ser. No. 839,283
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—261

255,100
PAINT BRUSH PROP
George E. Filice, 1028 Windsor, Lafayette, Calif. 94549
Filed Sep. 19, 1977, Ser. No. 834,549
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—289

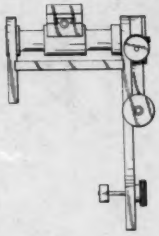


255,101
ELECTRIC CLOCK
Donald J. Booty, 513 Durham Dr., Frankfort, Ill. 60423
Filed Jan. 16, 1978, Ser. No. 869,931
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

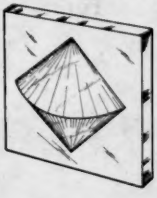
255,102
HOUSEHOLD WATER LEAK INDICATOR
Preston Ross, 307 S. Quincy, Commerce, Okla. 74339
Filed Oct. 31, 1977, Ser. No. 847,303
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—46

255,103
ROOM THERMOSTAT OR SIMILAR ARTICLE
Norbert T. Wolfe, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 25, 1977, Ser. No. 845,175
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—51

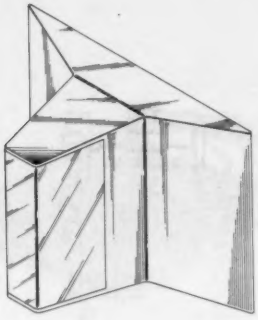
255,104
ACCESSORY MOUNT FOR THEODOLITE
Thomas N. Haidek, 11709 Century Dr., Oklahoma City, Okla. 73160
Filed Sep. 19, 1977, Ser. No. 834,312
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—74



255,105
UP AND DOWN DIRECTIONAL SIGNAL FOR AN ELEVATOR
Pekka Perjo, Helsinki, Finland, assignor to Kone Osakeyhtio, Helsinki, Finland
Filed Apr. 10, 1978, Ser. No. 895,868
Claims priority, application Finland, Dec. 8, 1977, 77731
Term of patent 14 years
Int. Cl. D10—*06*; D26—*05*
U.S. Cl. D10—108



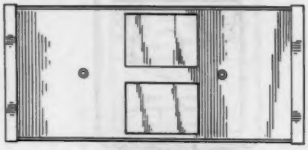
255,106
INDICATOR LAMP ASSEMBLY
Frederick F. Bodenrader, Georgetown, Mass., and John F. Gilleo, Jr., Kwajalein, Trust Ter. Pacific Isl., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Feb. 16, 1978, Ser. No. 878,234
Term of patent 14 years
Int. Cl. D10—*06;* D26—*05*
U.S. Cl. D10—114



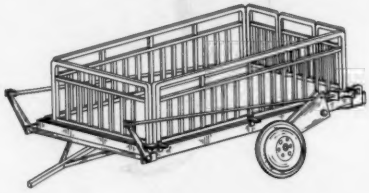
255,107
EMERGENCY VEHICLE WARNING LIGHT
Richard V. Slepetz, 722 Park Ave., Herndon, Va. 22070
Filed Apr. 12, 1978, Ser. No. 895,875
Term of patent 14 years
Int. Cl. D10—*06;* D26—*06*
U.S. Cl. D10—114

255,108
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,764
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

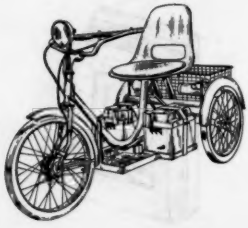
255,109
LIVE POULTRY TRANSFER STATION
Gary L. Squier, P.O. Box 231, Gaylord, Minn. 55334
Continuation-in-part of Ser. No. 508,191, Sep. 23, 1974, Pat. No. Des. 243,552. This application Feb. 28, 1977, Ser. No. 772,978
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60



255,110
TRAILER
Robert J. Matthews, 5425 Myers Ct., Sioux City, Iowa 51106
Filed Sep. 29, 1977, Ser. No. 837,668
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—105



255,111
ELECTRIC POWERED TRICYCLE
Jack P. Palmer, 509 Paden St., Endicott, N.Y. 13760
Filed May 30, 1978, Ser. No. 910,663
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



255,112

ENGINE EXHAUST HEADER PIPE UNIT

Steven B. Alexander, Anaheim, Calif., assignor to American Turbo-Pak, Inc., Santa Ana, Calif.

Filed Oct. 16, 1978, Ser. No. 951,357

Term of patent 14 years

Int. Cl. D12—*11;* D15—*1*

U.S. Cl. D12—194

255,113

ELECTRIC POWER LOAD CONTROLLER

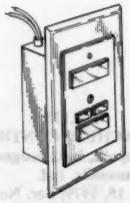
Hugh R. Pease, Saratoga, and Malcolm L. Stadtmiller, San Jose, both of Calif., assignors to Hutec Corporation, San Jose, Calif.

Filed Nov. 11, 1977, Ser. No. 850,603

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—11



255,114

SNAP-IN SWITCH HOUSING

Wolfgang F. Bienwald, Melville, and Anthony Tufano, Rosedale, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,511

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—32

255,115

TURNTABLE

Cary L. Christie, 1027 Crosby, Simi Valley, Calif. 93065

Filed Jun. 3, 1977, Ser. No. 803,398

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—17

255,116

PORTABLE PROGRAMMER FOR PROGRAMMABLE CONTROLLER

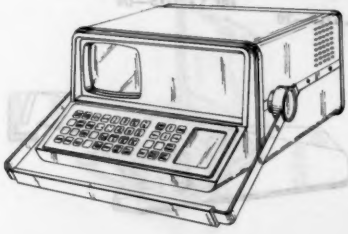
John B. MacDonald, Boston, and Michael J. Mercadante, North Quincy, both of Mass., assignors to Gould Inc., Modicon Division, Andover, Mass.

Filed Mar. 3, 1978, Ser. No. 883,340

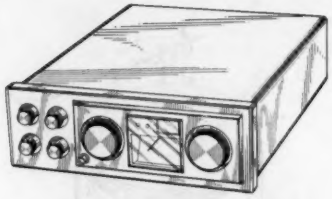
Term of patent 14 years

Int. Cl. D14—*02*

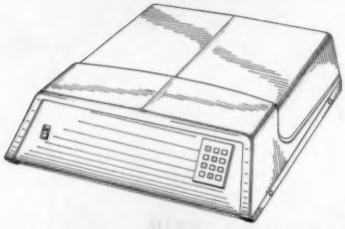
U.S. Cl. D14—43



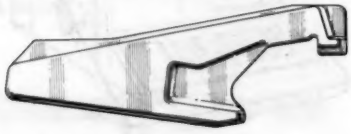
255,117
MOTOR VEHICULAR CITIZENS' BAND TRANSCEIVER
Kikuo Ohta, Katano, and Satoru Usami, Hurajata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,290
Claims priority, application Japan, Jan. 20, 1977, 52-1481
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



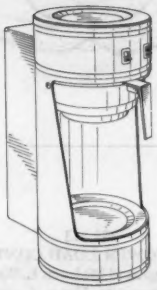
255,118
PAGING TERMINAL
William R. Van Horn, and James M. Longly, both of Lexington, Nebr., assignors to Reach Electronics, Inc., Lexington, Nebr.
Filed Dec. 28, 1978, Ser. No. 974,130
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



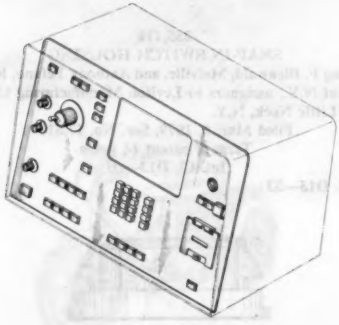
255,119
TOOTH FOR EXCAVATING EQUIPMENT
Jouko K. Korpi, Degerfors, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden
Filed Sep. 1, 1977, Ser. No. 829,838
Claims priority, application Sweden, Mar. 8, 1977, 77-0544
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—29



255,120
AUTOMATIC COFFEE MAKER
William M. Bardeau, 158 Norfinch Dr., Downsview, Ontario, Canada (M3N 1Y1)
Filed Mar. 14, 1978, Ser. No. 886,618
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—113



255,121
MILLING MACHINE CONTROL PANEL
Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Co., Inc., Indianapolis, Ind.
Filed Feb. 15, 1979, Ser. No. 12,398
Term of patent 14 years
Int. Cl. D14—*02*; D15—*09*
U.S. Cl. D15—138



255,122

VACUUM DEPOSITION APPARATUS

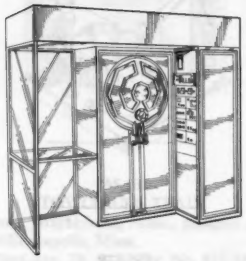
Gunard O. B. Mahl, San Francisco, Calif., assignor to Cha Industries, Menlo Park, Calif.

Filed Apr. 17, 1978, Ser. No. 896,901

Term of patent 14 years

Int. Cl. D15—*99*

U.S. Cl. D15—199



255,123

CONTACT PRINTING CABINET

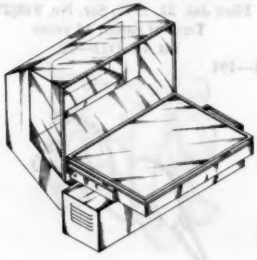
Dennis C. Duerr, 3512 Iowa Trail, Frazier Park, Calif. 93225

Filed Aug. 8, 1977, Ser. No. 822,645

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—29



255,124

CALCULATING MACHINE

Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha (Sharp Corp.), Osaka, Japan

Filed Feb. 16, 1978, Ser. No. 878,489

Claims priority, application Japan, Aug. 24, 1977, 52/33905

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—7

255,125

CALCULATING MACHINE

Shigetoshi Hazama, and Matafumi Ikeda, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha (Sharp Corp.), Osaka, Japan

Filed Jun. 19, 1978, Ser. No. 916,872

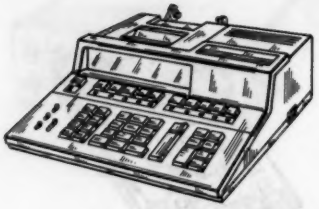
Claims priority, application Japan, Dec. 27, 1977, 52/51933

Term of patent 14 years

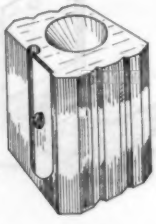
Int. Cl. D18—*01*

U.S. Cl. D18—7

255,126
CALCULATING MACHINE
Yoshihisa Ohie, and Matafumi Ikeda, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha (Sharp Corp.), Osaka, Japan
Filed Jun. 19, 1978, Ser. No. 917,030
Claims priority, application Japan, Jan. 6, 1978, 53/192
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

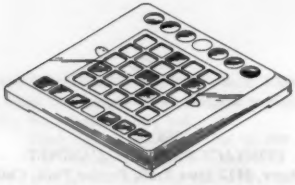


255,127
PENCIL SHARPENER
Werner Möbius, Hindenburgstrasse 77, Erlangen, Fed. Rep. of Germany
Filed Feb. 23, 1978, Ser. No. 880,349
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 7372
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73



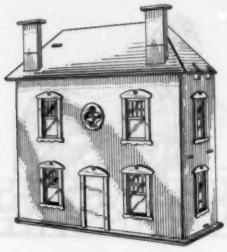
255,128
HOLDER FOR A WRITING INSTRUMENT OR SIMILAR ARTICLE
Kenneth Pirolozzi, 1834 N. Harvard Blvd., Hollywood, Calif. 90027
Filed May 30, 1978, Ser. No. 910,583
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—82

255,129
GAME BOARD
Ned Strongin, Baldwin, N.Y., assignor to CBS Inc., New York, N.Y.
Filed Mar. 13, 1978, Ser. No. 886,001
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17

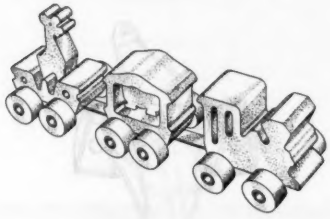


255,130
EXERCISE SUPPORT
Alfiero F. Balzano, 4333 Sunny La., Yorba Linda, Calif. 92686
Filed Jul. 22, 1977, Ser. No. 818,274
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

255,131
TOY DOLL HOUSE
William D. Gordon, Sr., Glenview, Ill., assignor to Arvey Corporation, Chicago, Ill.
Filed Jun. 16, 1978, Ser. No. 916,050
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114



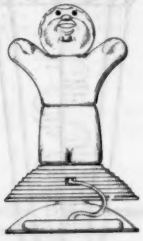
255,132
TOY CIRCUS TRAIN
Ralph M. Nowak, Marblehead, Mass., assignor to CPG Products Corp., Minneapolis, Minn.
Filed Jan. 23, 1978, Ser. No. 871,417
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—129



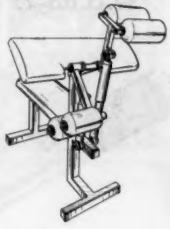
255,133
STUFFED ANIMAL TOY
Sheri Tingey, Moose, Wyo., assignor to The Freedom Zoo, Inc., Jackson, Wyo.
Filed Nov. 14, 1977, Ser. No. 850,979
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—148

255,134
STUFFED ANIMAL TOY
Sheri Tingey, Moose, Wyo., assignor to The Freedom Zoo, Inc., Jackson, Wyo.
Filed Nov. 14, 1977, Ser. No. 850,980
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—148

255,135
ANIMATE FIGURE TOY
Richard A. Chase, Baltimore, Md.; D. Michael Williams, Morin Heights, Canada, and Danny E. Simpson, Baltimore, Md., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Dec. 2, 1977, Ser. No. 856,888
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

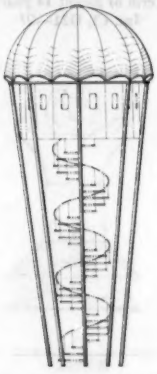


255,136
ARM CURL EXERCISING MACHINE
Jerry D. Brentham, 102 Elm Dr., Belton, Tex. 76513
Filed Jul. 11, 1977, Ser. No. 817,482
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



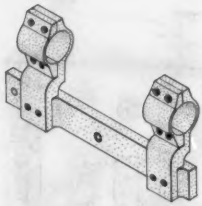
255,137
TABLE TENNIS PADDLE
John J. Bowen, 419 E. Chapman St., Ely, Minn. 55731
Filed Sep. 29, 1977, Ser. No. 838,119
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—213

255,138
JUMP TOWER FOR AMUSEMENT RIDE
Gerald M. Sermersheim, Fort Wayne, Ind., assignor to Geronimo Trooper, Inc., Greenfield, Ind.
Filed Apr. 25, 1977, Ser. No. 790,765
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—242

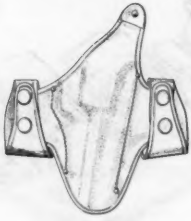


255,139
ELECTRIC BATON FOR LAW ENFORCEMENT PERSONNEL
James A. Smith, 1 Thayer Rd., Colorado Springs, Colo. 80906
Filed Sep. 26, 1977, Ser. No. 836,698
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1

255,140
SIDE MOUNT FOR TELESCOPIC SIGHT
Gerald T. Weast, Detroit, Mich., assignor to John D. Vetter, Tulsa, Okla., a part interest
Filed Mar. 22, 1978, Ser. No. 889,106
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

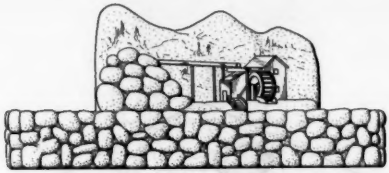


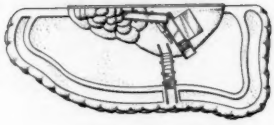
255,141
HOLSTER
Earl J. Clark, Frederick, Md., assignor to Tandy Brands, Inc., Fort Worth, Tex.
Filed Jan. 12, 1978, Ser. No. 869,024
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13



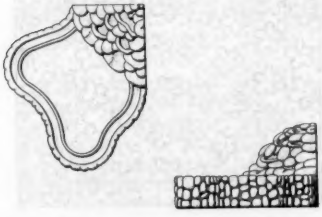
255,142
COMBINED WATERFALL AND GARDEN POND
Clarence F. Abbott, 2512 Whittier Dr., Davis, Calif. 95616
Filed May 3, 1978, Ser. No. 902,779
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

255,143
GARDEN POND
Clarence F. Abbott, 2512 Whittier Dr., Davis, Calif. 95616
Filed May 3, 1978, Ser. No. 902,784
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

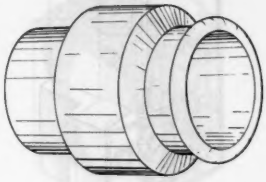




255,144
COMBINED WATERFALL AND GARDEN POND
Clarence F. Abbott, 2512 Whittier Dr., Davis, Calif. 95616
Filed May 3, 1978, Ser. No. 902,785
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13



255,145
CONNECTION FITTING FOR TUBULAR CONDUITS
Bill P. P. Nederman, Haladid 3, S-252 33 Helsingborg, Sweden
Filed Apr. 11, 1977, Ser. No. 786,681
Claims priority, application Sweden, Oct. 21, 1976, 2040/76
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



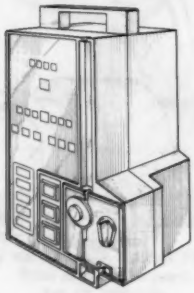
255,146
STOVE
Eugene Kuhl, Mertzwiller, France, assignor to De Dietrich & Cie, Niederbronn-les-Bains, France
Filed Feb. 17, 1978, Ser. No. 879,101
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—105

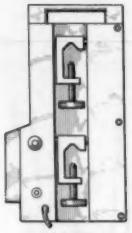
255,147

FLUID METERING APPARATUS

Thurman S. Jess, Mundelein, and Nicholas Zissimopoulos, Schaumburg, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1977, Ser. No. 857,047
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—8



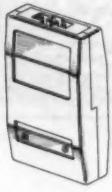


255,148

ELECTROSURGICAL CURRENT SUPPRESSOR

Earl F. Robinson; Rex O. Bare, both of Lawrence, and Wayne Hayob, Roeland Park, all of Kans., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 24, 1978, Ser. No. 881,153
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

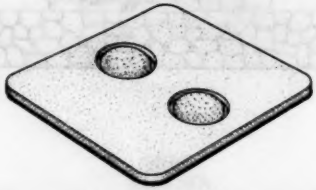


255,149

DUAL TERMINAL ELECTRODE FOR MEDICAL MONITORING

Albert J. Bevilacqua, Downers Grove, Ill., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Oct. 4, 1977, Ser. No. 839,265
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—29

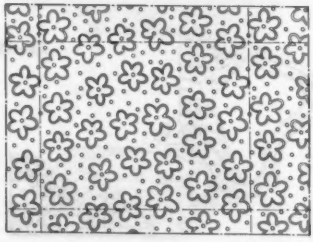


255,150

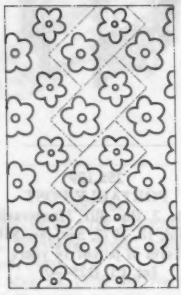
EMBOSSED PATTERNED SHEET OF MATERIAL FOR SANITARY NAPKINS

Paul S. Woon, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

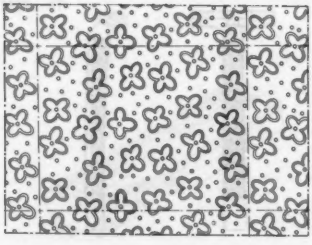
Filed Oct. 3, 1977, Ser. No. 838,553
Term of patent 14 years
Int. Cl. D24—*04*; D5—*06*
U.S. Cl. D24—51



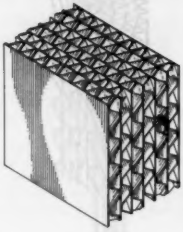
255,151
EMBOSSED PATTERNED SHEET OF MATERIAL FOR SANITARY NAPKINS
Paul S. Woon, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Oct. 3, 1977, Ser. No. 838,554
Term of patent 14 years
Int. Cl. D24—*04;* D5—*06*
U.S. Cl. D24—51



255,152
EMBOSSED PATTERNED SHEET OF MATERIAL FOR SANITARY NAPKINS
Paul S. Woon, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Oct. 3, 1977, Ser. No. 839,220
Term of patent 14 years
Int. Cl. D24—*04;* D5—*06*
U.S. Cl. D24—51

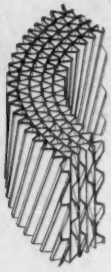


255,153
TUBE SETTLER MODULE
Charles L. Meurer, 5937 E. Weaver Cir., Englewood, Colo. 80111
Filed Dec. 11, 1978, Ser. No. 967,997
Term of patent 14 years
Int. Cl. D24—*99;* D23—*01*
U.S. Cl. D24—99



255,154
CIRCULAR TUBE SETTLER MODULE
Charles L. Meurer, 5937 E. Weaver Cir., Englewood, Colo. 80111
Filed Mar. 7, 1979, Ser. No. 18,427
Term of patent 14 years
Int. Cl. D24—*99;* D23—*01*
U.S. Cl. D24—99

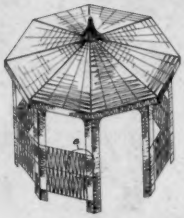
255,155
CURVED TUBE SETTLER MODULE SECTION
Charles L. Meurer, 5937 E. Weaver Cir., Englewood, Colo. 80111
Filed Mar. 7, 1979, Ser. No. 18,428
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D24—99



255,156
BUILDING
Monica P. Subtirelu, Columbus, Ohio, assignor to Cardinal Industries, Inc., Columbus, Ohio
Filed Jun. 5, 1978, Ser. No. 912,585
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

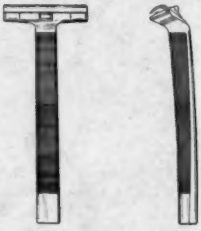
255,157
RESIDENTIAL BUILDING
Monica P. Subtirelu, Columbus, Ohio, assignor to Cardinal Industries, Inc., Columbus, Ohio
Filed Jun. 5, 1978, Ser. No. 912,586
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

255,158
GAZEBO
Donald E. Hanaford, 4601 S. 35th St., Phoenix, Ariz. 85040
Filed Oct. 16, 1978, Ser. No. 951,467
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23

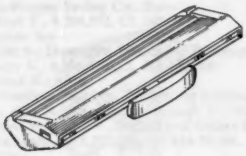


255,159
PORTABLE POST
James A. Selbee, Rte. 2, Box 301, Huntersville, N.C. 28078
Filed Jul. 18, 1977, Ser. No. 816,494
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—78

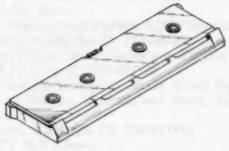
255,160
RAZOR
Michael J. Gray, Duxbury, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 20, 1978, Ser. No. 888,515
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



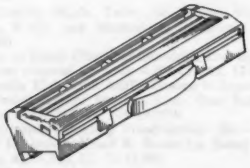
255,161
SAFETY RAZOR CARTRIDGE WITH CLEAN-OUT DEVICE
Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Mar. 15, 1978, Ser. No. 886,711
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—47



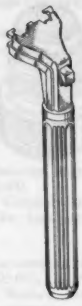
255,162
RAZOR BLADE ASSEMBLY
Robert A. Trotta, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 24, 1978, Ser. No. 890,223
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—47



255,163
SAFETY RAZOR CARTRIDGE WITH CLEAN-OUT DEVICE
Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Sep. 27, 1978, Ser. No. 946,389
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—47

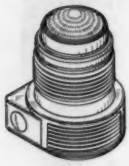


255,164
RAZOR HANDLE
David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 11, 1978, Ser. No. 904,942
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

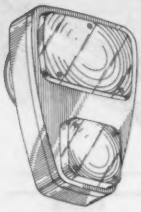


255,165
RAZOR HANDLE
David S. Byrne, Atlantic Highlands, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed May 11, 1978, Ser. No. 904,943
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—48

255,166
ELECTRIC SHAVER
Isao Ayukawa; Tamaki Takaoka, and Teruko Hayano, all of Osaka, Japan, assignors to Sharp Kabushiki Kaisha (Sharp Corp.), Osaka, Japan
Filed Mar. 20, 1978, Ser. No. 888,516
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—50



255,167
AUXILIARY LIGHT FOR VEHICLE HAVING ATTACHED PLOW BLADE
Vernon L. Hetrick, Fairview Park, Ohio, assignor to Meyer Products, Inc., Cleveland, Ohio
Filed Oct. 20, 1977, Ser. No. 843,896
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—35



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MAY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Borneman, Lawrence A., 4,204,472, Cl. 101-426.000.

A. F. Dormeyer Manufacturing Co., Inc.: *See*—
Flentge, Robert W., 4,205,291, Cl. 336-92.000.

AB Scandinavian Energy Saving Co.: *See*—
Wikstrom, Axel T., 4,204,572, Cl. 165-95.000.

Abbott Laboratories: *See*—
Tadanier, John S.; Dunnigan, Daniel A.; Freiberg, Leslie A.; and Martin, Jerry R., 4,205,070, Cl. 424-180.000.

Abramov, Vsevolod V.: *See*—
Menshutin, Vasily P.; Akutin, Modest S.; Iovdalsky, Nikolai V.; Minakova, Alla N.; Zherebtsov, Evgeny R.; Sokolov, Anatoly D.; Abramov, Vsevolod V.; Melekhova, Galina D.; and Ustkachkintsev, Alexandr N., 4,205,030, Cl. 264-40.100.

Abumi, Takao: *See*—
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,205,347, Cl. 358-191.100.

ACF Chemiefarma N.V.: *See*—
Ladage, Cornelis A.; van Linge, Douwe J.; and van Riessen, Huibert A., 4,205,089, Cl. 424-365.000.

Acra Electric Corporation: *See*—
Hummel, Matt N., 4,204,316, Cl. 29-61.00N.

Acurex Corporation: *See*—
Kendall, Robert M.; Kesselring, John P.; and Krill, Wayne V., 4,204,829, Cl. 431-7.000.

Adams Industries, Inc.: *See*—
Knecht, Helmut, 4,204,465, Cl. 99-293.000.

Adams, Michael G., to Weyerhaeuser Company. Vase holder. 4,204,598, Cl. 206-426.000.

Agate, Robert N.: *See*—
Cisco, Thomas F.; Hansen, George E.; and Agate, Robert N., 4,204,916, Cl. 203-6.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Bridoux, Edouard; Bruneel, Christian; Haine, Francis; and Thomin, Guy, 4,204,435, Cl. 73-626.000.
Cailliot, Serge, 4,204,964, Cl. 210-370.000.

AGFA-Gevaert, A.G.: *See*—
Bauer, Walter; Krobel; and Farber, 4,204,724, Cl. 354-281.000.
Hofstetter, Franz, 4,204,734, Cl. 355-68.000.
Kohler, Robert; Muller, Jorn; Gigiberger, Dieter; and Bestenreiner, Freidrich, 4,204,731, Cl. 355-16.000.
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, 4,204,867, Cl. 430-376.000.
Wurfel, Reinhart, 4,204,620, Cl. 226-91.000.

AGFA-GEVAERT N.V.: *See*—
Van Landeghem, Willy K.; and Suys, Andre R., 4,205,116, Cl. 428-409.000.

Aginsky, Yacov. Intramedullary nail with expanding mechanism. 4,204,531, Cl. 128-92.0BC.

Agopyan, Berdje. Retractable roof. 4,204,372, Cl. 52-64.000.

Aida, Ko; Uchida, Kinya; and Kawada, Izumi, to Aida, Ko. Process for the production of coenzyme Q. 4,205,125, Cl. 435-133.000.

Air Industrie: *See*—
Doucin, Guy; and Marchal, Paul, 4,204,340, Cl. 34-225.000.

Airco, Inc.: *See*—
Young, Morris S.; and Larbalestier, David C., 4,205,119, Cl. 428-614.000.

Airwick Industries, Inc.: *See*—
Hennart, Claude; Rabussier, Bernard; Mandon, Jean-Pierre; and Sapin, Joel, 4,205,066, Cl. 424-84.000.

Aisan Industry Co., Ltd.: *See*—
Harada, Toshiro; Kubo, Tadayuki; Kasuya, Kazusato; and Watanabe, Yukihiro, 4,204,482, Cl. 123-32.0EE.

Aizawa, Hiroshi: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Hashimoto, Teiji, 4,204,762, Cl. 354-242.000.

Aki, Osami: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,205,180, Cl. 560-168.000.

Akiyama, Osamu, to Bando Chemical Industries, Ltd. Basic material for making a porous material for seals. 4,205,137, Cl. 521-145.000.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See*—
Ullmann, Werner; Buhler, Ernst; Kilcher, Beat; Ruh, Herbert; and Sieg, Arno, 4,205,212, Cl. 219-69.00W.

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Braad, Poul E.; Jensen, Knud B.; Rosendal, Hans; and Sevaldsen, Flemming, 4,204,415, Cl. 72-52.000.

Akutin, Modest S.: *See*—
Menshutin, Vasily P.; Akutin, Modest S.; Iovdalsky, Nikolai V.; Minakova, Alla N.; Zherebtsov, Evgeny R.; Sokolov, Anatoly D.; Abramov, Vsevolod V.; Melekhova, Galina D.; and Ustkachkintsev, Alexandr N., 4,205,030, Cl. 264-40.100.

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Albright, Charles D.: *See*—
Gasparaitis, Bernard; and Albright, Charles D., 4,205,319, Cl. 343-792.000.

Alden Research Foundation: *See*—
Williams, George C.; and Fay, Edward W., 4,205,323, Cl. 346-165.000.

Aldridge, Clyde L.: *See*—
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,204,943, Cl. 208-50.000.

Alexander, Joseph H., to General Tire & Rubber Company, The. Apparatus and method for handling uncured tires. 4,204,903, Cl. 156-394.000.

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Almqvist, Kent R.; Christensen, Jan A.; Alfheim, Roar L.; and Torgersen, Lars, 4,205,031, Cl. 264-40.400.

Allen, Bernard M.; Rubin, Wallace; and Watson, Brian, to Multicore Solders Limited. Soft soldering of aluminium. 4,204,889, Cl. 148-26.000.

Allen-Bradley Company: *See*—
Frey, Sydney W., Jr., 4,205,296, Cl. 338-150.000.

Allied Chemical Corporation: *See*—
Kurtz, Bruce E.; and Fitch, Robert H., 4,204,920, Cl. 204-98.000.
Peckinpaugh, Frank L.; and Biron, Raymond J., 4,204,828, Cl. 425-72.00S.

Allis-Chalmers Corporation: *See*—
Milliken, James W., Jr., 4,204,383, Cl. 56-10.200.
Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., 4,204,948, Cl. 209-223.00R.

Allison, James E., Jr.: *See*—
Leyva, Rodolfo M.; and Allison, James E., Jr., 4,204,499, Cl. 119-5.000.

Allocca, John A. Method and apparatus for noninvasive monitoring of intracranial pressure. 4,204,547, Cl. 128-748.000.

Alloying Surfaces, Inc.: *See*—
Serlin, Richard A.; and Field, Thomas A., 4,205,211, Cl. 219-76.130.

Almeida, June D., to Burroughs Wellcome Co. Virus propagation. 4,205,131, Cl. 435-235.000.

Almond, William C. Automatic fish catcher. 4,204,355, Cl. 43-15.600.

Almqvist, Kent R.; Christensen, Jan A.; Alfheim, Roar L.; and Torgersen, Lars. Method of producing laminates of reinforced or non-reinforced thermosetting resin in a low pressure chamber. 4,205,031, Cl. 264-40.400.

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Marrs, Clinton E., 4,204,595, Cl. 198-836.000.

American Air Filter Company, Inc.: *See*—
Ko, Raymond, 4,204,847, Cl. 55-257.0PV.
Pasha, Mohiuddin; O'Hara, David K.; and French, Joseph A., 4,204,980, Cl. 252-428.000.

American Can Company: *See*—
Rouse, John W.; and Payne, Archibald H., 4,204,641, Cl. 239-121.000.

American Color & Chemical Corporation: *See*—
Desai, Kishor A., 4,204,994, Cl. 260-174.000.

American Cyanamid Company: *See*—
Goodman, Richard M., 4,205,143, Cl. 525-213.000.
Shepherd, Robert G., 4,205,085, Cl. 424-309.000.
Streetman, William E.; and Daftary, Shashikumar H., 4,205,039, Cl. 264-206.000.

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Beluzzi, James D.; McGregor, William H.; and Stein, Larry, 4,205,069, Cl. 424-177.000.
Sarantakis, Dimitrios, 4,204,990, Cl. 260-112.50S.

Ames-Yissum, Ltd.: *See*—
Wagner, Daniel B.; Pick, Anthony J.; and Feingers, Judith, 4,205,058, Cl. 424-1.000.

AMF Incorporated: *See*—
Hall Jr., Harleston J.; Sassin, Roger I.; and Yuhas, Drew J., 4,204,681, Cl. 273-73.00C.

Anderegg, Charles M.: *See*—
Moorer, Howard H.; and Anderegg, Charles M., 4,204,877, Cl. 106-90.000.

Andersen, Hans S.; and Christiansen, Preben, to Danfoss A/S. Arrangement for influencing the operating quantity of a servo-motor. 4,204,460, Cl. 91-447.000.

Andra Rolf: *See*—
Moser, Theo; Andra Rolf; Rittler, Roland; and Strampfer, Armin, 4,204,951, Cl. 209-625.000.

Antholz, Phillip: *See*—
Swarthout, E. Jack; and Antholz, Phillip, 4,204,983, Cl. 260-17.4GC.

Anthony, Kevin E.: *See*—
Fraser, Donald B.; Dim, Alexander; Anthony, Kevin E.; Costello, Wayne R.; and Grazier, Phillip E., 4,204,922, Cl. 204-105.00R.

Anzerberger, Joseph F., Sr., to Stauffer Chemical Company. Process for removing soluble metallic salts from a phosphate ester functional fluid. 4,205,023, Cl. 260-990.000.

Aoshiba, Norihiro, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for attaching implement to earth moving vehicle. 4,204,794, Cl. 414-723.000.

Aoyagi, Mitsuo: *See*—
Kobayashi, Shuji; Aoyagi, Mitsuo; Kanno, Tominori; Ueno, Kazuei; and Nomura, Shin-ichi, 4,205,098, Cl. 427-76.000.

Aoyama, Tokuichi: *See*—
Nakagawa, Itsusuke; and Aoyama, Tokuichi, 4,204,486, Cl. 123-41.600.

Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, to Ohbayashi-Gumi, Ltd.; Daicel Ltd.; and Fujisawa Pharmaceutical Co., Ltd. Exposed aggregate finishing method for concrete. 4,205,040, Cl. 264-233.000.

Araki, Yoshitaka: *See*—
Toyoda, Kenji; Araki, Yoshitaka; and Watanabe, Sakuji, 4,204,755, Cl. 354-36.000.

Araya, Takeshi; and Udagawa, Tsugio, to Hitachi, Ltd.; and Hitachi Seiko Ltd. Automatic weld line copying apparatus. 4,205,217, Cl. 219-124.340.

Arbit, Harold A.: *See*—
Canterino, Peter J.; and Arbit, Harold A., 4,205,114, Cl. 428-315.000.

Ardac, Inc.: *See*—
Iannadrea, Gerald; Gorgone, Robert L.; and Kovach, Alan J., 4,204,765, Cl. 356-71.000.

Arendt, Henry P.: *See*—
Holland, Warren E.; Burley, James D.; and Arendt, Henry P., 4,204,690, Cl. 277-27.000.

Arledter, Hanns F.; and Mehl, Werner. Process for the thermal polymerization, polycondensation or condensation of monomeric synthetic-resin materials in porous workpieces. 4,205,097, Cl. 427-44.000.

Armstrong, Edward T. System for pollution suppression. 4,204,955, Cl. 210-61.000.

Arnold, Benjamin L., III, to Arnold, Benjamin L., III. Cigarette lighter holder and adapter. 4,205,367, Cl. 362-61.000.

Arnold Engineering Company, The: *See*—
Winn, Clarence W., 4,204,317, Cl. 29-827.000.

Arroyo Research and Consulting Company: *See*—
Kaelble, David H., 4,204,325, Cl. 433-9.000.

Arts, Jerold F.; Owen, William L., Jr.; and Tull, Bernie D., Jr., to Western Electric Company, Inc. Radio signal safety facilities for controlling the operation of a work fabricating device. 4,205,239, Cl. 307-328.000.

Arvidson, Bo R.: *See*—
Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., 4,204,948, Cl. 209-223.00R.

Asahi Glass Company, Limited: *See*—
Kozuka, Mikio, 4,204,644, Cl. 239-220.000.

Asahi Medical Co., Ltd.: *See*—
Yamakoshi, Kenichi, 4,204,545, Cl. 128-693.000.

Asaka, Urataro: *See*—
Tsuboi, Masaharu; and Asaka, Urataro, 4,204,585, Cl. 180-219.000.

Asano, Kazuhiro; Ueda, Makoto; Torisawa, Akira; Shida, Masaharu; Satoh, Katsuhiko; and Mandai, Masaaki, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,204,397, Cl. 368-202.000.

Asano, Kazuhiro, to Kabushiki Kaisha Daini Seikosha. Voltage dropping circuit. 4,205,369, Cl. 363-62.000.

Asano, Takeshi: *See*—
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; and Sasaki, Kanemichi, 4,205,081, Cl. 424-279.000.

Asanuma, Katsumi; and Mogi, Shigeru, to Fuji Photo Film Co., Ltd. Format film selecting device. 4,204,754, Cl. 353-116.000.

Atherton, John H.; Dobson, Derrick C.; Hodgkinson, Ian; and Clarke, John R. P., to Imperial Chemical Industries Limited. Method of analysis. 4,204,838, Cl. 23-230.00R.

Atlantic Richfield Company: *See*—
Yoo, Jin S.; Burk, Emmett H., Jr.; and Karch, John A., 4,204,840, Cl. 44-1.0SR.

Atlas Copco Aktiebolag: *See*—
Lavon, Erik V., 4,204,715, Cl. 299-16.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Harlfinger, Rudolf; Ehehalt, Theobald; and Kappes, Alfred, 4,204,924, Cl. 204-129.350.

Aufderhaar, Ernst; Gallay, Jean J.; Kuhne, Manfred; Meyer, Alfred; Rechsteiner, Oswald; Schellenbaum, Max; and Fumeaux, Jean-Paul, to Ciba-Geigy Corporation. Benzimidazole sulphides as anthelmintic agents. 4,205,077, Cl. 424-273.00B.

August Lepper, Maschinen-U. Apparatebau GmbH: *See*—
Muller, Franz, 4,204,339, Cl. 34-75.000.

Auracher, Franz; Zeitler, Karl-Heinz; and Rauscher, Walter, to Siemens Aktiengesellschaft. Process for producing a device for coupling two light conducting fiber cables. 4,204,310, Cl. 29-445.000.

Averyanov, Sergei V.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Averyanova, Lidia A.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Avicon, Inc.: *See*—
Cruz, Mamerto M., Jr., 4,204,992, Cl. 260-123.700.

AVM Corporation: *See*—
Sheppard, William L., 4,204,812, Cl. 417-395.000.

Axen, Udo F., to Upjohn Company, The. 6-Keto prostaglandin E-type compounds. 4,205,178, Cl. 560-121.000.

B.F.G. Glassgroup: *See*—
Hubert, Francois; Laurent, Michel; and Leger, Lucien, 4,204,721, Cl. 316-19.000.

Baba, Toshihiko: *See*—
Suzuki, Takao; Komatsu, Yoshimasa; Takeda, Akimichi; and Baba, Toshihiko, 4,205,214, Cl. 219-97.000.

Babayan, Vigen K., to Stokeley-Van Camp, Inc. Method for the treatment of gallstones. 4,205,086, Cl. 424-312.000.

Babb, Burton A., to Babbco, Ltd. Dynamic loudspeaker having magnetic assembly adhesively bonded within a surrounding basket. 4,205,205, Cl. 179-115.50R.

Babbco, Ltd.: *See*—
Babb, Burton A., 4,205,205, Cl. 179-115.50R.

Babcock-BSH Aktiengesellschaft vormals Buttner-Schilde-Haas AG: *See*—
Roos, Friedrich; and Bahner, Friedrich, 4,204,337, Cl. 34-31.000.

Babcock & Wilcox Company, The: *See*—
Norton, Frank E., 4,204,305, Cl. 29-157.400.

Bachot, Jean; Bouy, Pierre; and Juillard, Michel, to Rhone-Poulenc Industries. Method of making porous plastic diaphragms and the resulting novel diaphragms. 4,204,938, Cl. 204-252.000.

Baer, Massimo, to Monsanto Company. Flame retardant resin compositions. 4,205,142, Cl. 525-166.000.

Bahner, Friedrich: *See*—
Roos, Friedrich; and Bahner, Friedrich, 4,204,337, Cl. 34-31.000.

Baird, James C.; and Warfield, Glenn R., to Procter & Gamble Company, The. Texturizing and steam deflavoring soy protein with high-speed turbine mixing. 4,205,094, Cl. 426-459.000.

Bakach, Joseph: *See*—
McMann, Renville H., Jr.; and Bakach, Joseph, 4,205,310, Cl. 340-750.000.

Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A. Method of testing objects for random actions thereon and digital simulator-computer system for effecting same. 4,205,383, Cl. 364-554.000.

Baker, Don R., to Stauffer Chemical Company. Diphenyl ether carbamates. 4,204,858, Cl. 71-111.000.

Balasubramanian, N., to Recognition Systems, Inc. Optical measuring system. 4,204,772, Cl. 356-376.000.

Baldwin, Brian C.; Shephard, Margaret C.; and Skidmore, Anthony M., to Imperial Chemical Industries Limited. Processes and composition for combating fungi. 4,205,075, Cl. 424-269.000.

Balfour, Lawrence H. Gasoline spill preventing apparatus. 4,204,564, Cl. 141-311.00A.

Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast/Dredging) B.V. and Banegbo B.V.: *See*—
Wolters, Tjako A., 4,204,347, Cl. 37-67.000.

Baltek Corporation: *See*—
Kohn, Jean, 4,204,900, Cl. 156-255.000.

Bando Chemical Industries, Ltd.: *See*—
Akiyama, Osamu, 4,205,137, Cl. 521-145.000.

Bannister, Alan S. Tubewell screen filters. 4,204,967, Cl. 210-459.000.

Banno, Hirokazu. Roller of a synthetic resin used for a belt-conveyor. 4,204,594, Cl. 198-827.000.

Banno, Taichi: *See*—
Yamamoto, Tadao; Takekawa, Hiroshi; Banno, Taichi; and Koshiishi, Kiyozo, 4,204,917, Cl. 204-1.00T.

Barber, Donald T.; and Scrymgeour, Thomas C., to Datafile Limited. Coded label. 4,204,639, Cl. 235-462.000.

Bardsley, Henry, III; Luiz, Fernando A.; Nilsen, Nils F.; and Simpson, Ronald C., to International Business Machines Corporation. Method and means for CPU recovery of non-logged data from a storage subsystem subject to selective resets. 4,205,374, Cl. 364-200.000.

Barker, Joseph: *See*—
Gunn, Christopher J.; and Barker, Joseph, 4,204,624, Cl. 227-45.000.

Barlow, William A.; Rhodes, Maurice; Sherliker, Francis R.; and Williams, Edward W., to Imperial Chemical Industries Limited. Electro-

coating process for producing a semiconducting film. 4,204,933, Cl. 204-181.00N.

Barner, Richard; and Hubscher, Joseph, to Hoffmann-La Roche Inc. Cholestane derivatives. 4,204,995, Cl. 260-239.55C.

Barnhart, Carl F., to International Business Machines Corporation. Performing arithmetic using indirect digital-to-analog conversion. 4,205,303, Cl. 340-347.0DA.

Barr, Iain G.: *See—*
Pike, Marshall; Barr, Iain G.; and Tirtiaux, Florent, 4,205,095, Cl. 426-607.000.

Barrett, James H., to Independent Television Companies Association. Television system transmitting enciphered data signals during field blanking interval. 4,205,343, Cl. 358-147.000.

Barsuhn, Horst E.; Olderdissen, Ulrich; and Schmidt, Werner, to International Business Machines Corporation. Storing partial words in memory. 4,204,634, Cl. 371-38.000.

Bartell, Jeffrey M.; and D'Elia, Robert V., to Goodyear Tire & Rubber Company, The. Method and apparatus for splicing hose. 4,204,897, Cl. 156-155.000.

Barton, Lester C.; Butler, Gene R.; and Butler, L. Dennis, to Sperry Rand Corporation. Bale alignment device. 4,204,791, Cl. 414-36.000.

Barton, Richard E.; Fultz, Jack V.; Narahara, Yoshiyasu; and Shebanow, Michael S. Disk drive unit incorporating a field-replaceable fixed disk assembly. 4,205,357, Cl. 360-135.000.

Barzynski, Helmut; Hartmann, Heinrich; Lautenbach, Dieter; Osterloh, Rolf; Goethlich, Lutz; and Heil, Guenter, to BASF Aktiengesellschaft. Curable coating composition. 4,205,139, Cl. 525-38.000.

BASF Aktiengesellschaft: *See—*
Barzynski, Helmut; Hartmann, Heinrich; Lautenbach, Dieter; Osterloh, Rolf; Goethlich, Lutz; and Heil, Guenter, 4,205,139, Cl. 525-38.000.
Henkler, Herbert; Koenig, Roland; Deichelmann, Hermann; and Koch, Volker, 4,205,393, Cl. 365-133.000.
Naarmann, Herbert; McKee, Graham E.; and Schmitt, Burghard, 4,205,144, Cl. 525-273.000.

BASF Wyandotte Corporation: *See—*
Britton, Wayne E.; and Krumpelt, Michael, 4,204,921, Cl. 204-98.000.

Basham, Dean V., to Tyrone Hydraulics, Inc. Regenerative drive system. 4,204,405, Cl. 60-371.000.

Bates, Leonard T., to Winget Limited. Mixing means. 4,204,773, Cl. 366-18.000.

Batjukov, Vladimir I.: *See—*
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V., 4,204,910, Cl. 176-30.000.

Bauer, Walter; Krobel; and Farber, to AGFA-Gevaert, A.G. Film cassette with anti-shock latching means. 4,204,724, Cl. 354-281.000.

Baughn, Milton J.: *See—*
Baughn, William E.; Williams, Kenneth R.; and McAlister, M. Khristian, 4,204,663, Cl. 254-88.000.

Baughn, William E.; Williams, Kenneth R.; and McAlister, M. Khristian, to Baughn, Milton J. Apparatus for lifting a reel. 4,204,663, Cl. 254-88.000.

Baxter, Bobby G., to Binkley Company, The. Trailer for lifting and transporting round bales of hay. 4,204,790, Cl. 414-24.500.

Baxter Travenol Laboratories, Inc.: *See—*
Bischof, Daniel F.; and Munsch, John M., 4,204,963, Cl. 210-321.00B.
Shim, Norman; and Knigge, Vincent L., 4,205,238, Cl. 235-92.0CT.

Bayer Aktiengesellschaft: *See—*
Daahn, Gahn, 4,205,062, Cl. 424-66.000.
Liebig, Lothar; Wingler, Frank; Margotte, Dieter; and Nouvertne, Werner, 4,205,140, Cl. 525-67.000.
Liebig, Lothar; Wingler, Frank; Humme, Gert; and Prinz, Richard, 4,205,141, Cl. 525-67.000.
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, 4,205,159, Cl. 528-338.000.
Muller, Hanns P.; and Wagner, Kuno, 4,205,138, Cl. 521-158.000.

Baylor, John M., to J. I. Case Company. Track joint with a thrust ring and a seal ring. 4,204,716, Cl. 305-11.000.

BBC Brown Boveri & Company Limited: *See—*
Hani, August; Horler, Hansulrich; and Ursprung, Hans, 4,204,586, Cl. 181-229.000.
Melton, Keith N.; and Mercier, Olivier, 4,205,293, Cl. 337-140.000.
Woodger, Andrew, 4,204,804, Cl. 415-219.00R.

Beale, John H.; and Moss, Ernest K., to Celotex Corporation, The. Closed cell phenolic foam. 4,205,135, Cl. 521-116.000.

Bearden, Roby, Jr.: *See—*
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,204,943, Cl. 208-50.000.

Beauchamp, Gerson E., to DeSoto, Inc. Calcium oxide or hydroxide to improve the charge acceptance of electrographic dielectric resins. 4,204,971, Cl. 252-63.500.

Beck, Hans W.: *See—*
Spits, Raymond; and Beck, Hans W., 4,204,782, Cl. 408-3.000.

Becker, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Printing machine transfer drum adjustable to variable sheet lengths. 4,204,471, Cl. 101-410.000.

Beckman Instruments, Inc.: *See—*
Franklin, Robert C., 4,205,261, Cl. 318-480.000.
Hong, Anita L., 4,205,183, Cl. 562-401.000.
Smith, Leland B.; and Loeb, Phillip J., 4,204,546, Cl. 128-731.000.
Sternberg, James C.; and Lillig, John E., 4,204,837, Cl. 23-230.00B.

Beecham Group Limited: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,205,067, Cl. 424-114.000.
Rogers, Norman H.; and O'Hanlon, Peter J., 4,205,002, Cl. 260-345.80R.

Beer, Reinhard: *See—*
United States of America, National Aeronautics and Space Administration; and Beer, Reinhard, 4,205,229, Cl. 250-352.000.

Bein, Thomas W., to United States of America, Navy. Discharge and pressure relief ports for mechanisms with involute shaped vanes. 4,204,816, Cl. 418-15.000.

Bell Telephone Laboratories, Incorporated: *See—*
Cox, Herbert M., 4,204,893, Cl. 148-175.000.
Dingle, Raymond; Gossard, Arthur C.; Petroff, Pierre M.; and Wiegmann, William, 4,205,329, Cl. 357-16.000.

Bellhouse, Brian J.; and Williams, William G., to National Research Development Corporation. Prosthetic valve. 4,204,283, Cl. 3-1.500.

Beluzzi, James D.; McGregor, William H.; and Stein, Larry, to American Home Products Corporation. Dipeptide narcotic antagonists. 4,205,069, Cl. 424-177.000.

Bendix Corporation, The: *See—*
Casey, Gary L.; and Hurlong, Granville, Jr., 4,204,507, Cl. 123-139.0AW.
Taig, Alistair G., 4,204,554, Cl. 137-101.000.

Bens, Frederick P., to Kolene Corp. Method for improving and article having improved wear resistance. 4,204,886, Cl. 148-15.500.

Bentall, Simon W., to Hilary Page "Sensible" Toys Limited. Segmental walking toy. 4,204,360, Cl. 46-98.000.

Bentele, Benedikt; and Hecht, Gert, to Siemens Aktiengesellschaft. Multistage side channel compressor. 4,204,800, Cl. 415-53.00T.

Berg, Erik E.; and Tingwall, Rolf, to Ingersoll Steel Company. Method of conditioning cast steel for hot working. 4,204,884, Cl. 148-2.000.

Berger, Walter: *See—*
Seifert, Dieter; Regler, Dieter; Ofenmacher, Volker; Moritz, Alfred; Freudlsperger, August; and Berger, Walter, 4,204,515, Cl. 125-16.00R.

Bergmann, Ewald; and Kottmann, Alfred, to L. Schuler GmbH. Device for conveying, stacking, and packing aligned laminations of electrical machines. 4,204,380, Cl. 53-520.000.

Bergwerksverband GmbH: *See—*
Kroger, Carl; Romey, Ingo; and Kolling, Georg, 4,205,035, Cl. 264-120.000.
Romey, Ingo; Schlutter, Aloys; and Sommerfeld, Rolf, 4,204,986, Cl. 260-28.5AS.

Bernard, Walter J.: *See—*
Randall, John J., Jr.; and Bernard, Walter J., 4,204,919, Cl. 204-29.000.

Berrecloth, Alan H. T.: *See—*
Hayward, Terence J.; and Berrecloth, Alan H. T., 4,204,553, Cl. 137-82.000.

Bestenreiner, Freidrich: *See—*
Kohler, Robert; Muller, Jorn; Giglberger, Dieter; and Bestenreiner, Freidrich, 4,204,731, Cl. 355-16.000.

Beutler, Robert R., to Motorola, Inc. CMOS Low current RC oscillator. 4,205,279, Cl. 331-111.000.

Beyer, Douglas E.: *See—*
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,205,016, Cl. 260-665.00R.

Bianchi, Giuseppe; deNora, Oronzio; and Spaziante, Placido M., to Oronzio deNora Impianti Elettrochimici S.p.A. Novel electrolytic amalgam denuder apparatus. 4,204,937, Cl. 204-219.000.

Biasotti, Joseph B.; Dorn, Peter; Herbstman, Sheldon; and Dille, Kenneth L., to Texaco Inc. Detergent gasoline composition. 4,204,841, Cl. 44-71.000.

Bier, Milan, to University Patents, Inc. Isoelectric focusing method. 4,204,929, Cl. 204-180.00R.

Bikbau, Marsel Y.: *See—*
Nudelman, Boris I.; Bikbau, Marsel Y.; Oborin, Pavel A.; and Kuznetsova, Tamara V., 4,204,878, Cl. 106-104.000.

Bilbrey, Robert A.; Munroe, William O.; and Powell, David G., to California Controls Company. Hydraulic safety mechanism. 4,204,513, Cl. 123-198.0DB.

Binaris, Christopher; Volz, Patricia S.; and Ohidy, Joseph. Tattooing device. 4,204,438, Cl. 81-9.220.

Bing, Valentijn B.; and Neis, Donald A., to Zenith Radio Corporation. Method for terminating an electrical resistor for a television CRT. 4,204,302, Cl. 29-25.130.

Binkley Company, The: *See—*
Baxter, Bobby G., 4,204,790, Cl. 414-24.500.

Biron, Raymond J.: *See—*
Peckinpaugh, Frank L.; and Biron, Raymond J., 4,204,828, Cl. 425-72.00S.

Bischof, Daniel F.; and Munsch, John M., to Baxter Travenol Laboratories, Inc. Sealing members for a membrane diffusion device. 4,204,963, Cl. 210-321.00B.

Bishop, Jack. Terminal pin insertion device. 4,204,319, Cl. 29-739.000.

Bitterli, William W.: *See—*
Games, John E.; Bitterli, William W.; and Healey, David M., 4,205,381, Cl. 364-505.000.

Bittle, L. Dalton. Golf hole cutter guide. 4,204,577, Cl. 172-25.000.

Bjornson, Geir, to Phillips Petroleum Company. Hydrodehydroxylation process using a rhenium-fluorided alumina catalyst. 4,205,017, Cl. 585-469.000.

Blackburn, Tom L., to GTE Automatic Electric Laboratories, Incorporated. Method and apparatus of controlling bias voltage in regulating amplifiers. 4,205,275, Cl. 330-279.000.

Blackburne, Robin M. Rackets. 4,204,680, Cl. 273-73.00D.

Blackwood, John; and Iannarone, Ronald, to Singer Company, The. Sewing machine bed extension latch. 4,204,493, Cl. 112-260.000.

Blake, Jon R., to General Mills, Inc. Food product containing orange citrus juice vessicle solids. 4,205,093, Cl. 426-333.000.

Blanchard, Clarence E., to Outboard Marine Corporation. Folding propeller. 4,204,806, Cl. 416-134.00R.

Blanton, William A., Jr.: *See*—
Flanders, Robert L.; and Blanton, William A., Jr., 4,204,944, Cl. 208-120.000.
Flanders, Robert L.; and Blanton, William A., Jr., 4,204,945, Cl. 208-120.000.

Blaupunkt-Werke GmbH: *See*—
Schindler, Bernd, 4,205,259, Cl. 315-408.000.

Blazey, Richard N., to Eastman Kodak Company. DC Biased stylus for electrostatic recording. 4,205,321, Cl. 346-153.000.

Bleiweiss, Arthur F.; Cotoara, Dumitru; and Willkes, Robert J., to Dominion Auto Accessories Limited. Emergency warning lamp. 4,205,366, Cl. 362-35.000.

Blessing, Hubert, to Levi Strauss & Co. Apparatus for hemming fabric pieces. 4,204,492, Cl. 112-121.290.

Bloomingdale, Jack W. Safety plug clip. 4,204,723, Cl. 339-36.000.

Blount, David H. Process for the production of poly(allyl halide amine silicate) reaction products. 4,205,155, Cl. 528-28.000.

Blum, Julian J.; and Thralls, Don J. W. Method and multi-layer label having pressure-sensitive mark transfer system. 4,204,706, Cl. 283-21.000.

Blundell, Kenneth, to P. H. Thermal Products Limited. Pipe insulation. 4,205,105, Cl. 428-36.000.

Bock, Erich, to Schubert & Salzer. Method and device for the production of a wrapped yarn. 4,204,392, Cl. 57-18.000.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See*—
Tamm, Rolf; Tomoff, Toma; and Huber, Bernhard, 4,204,430, Cl. 73-423.00A.
Tomoff, Toma, 4,204,770, Cl. 356-312.000.

Bodig, Bernd: *See*—
Jundt, Werner; Bodig, Bernd; Roozenbeek, Herman; and Werner, Peter, 4,204,508, Cl. 123-148.00E.

Bohm, Howard A.: *See*—
Monsimer, Harold G.; and Bohm, Howard A., 4,205,060, Cl. 424-14.000.

Boie, Immo: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, 4,204,867, Cl. 430-376.000.

Bokros, Jack C.; Shim, Hong S.; and Haubold, Axel D., to CarboMedics, Inc. Multistrand carbon coated sutures. 4,204,542, Cl. 128-335.500.

Boliden Aktiebolag: *See*—
Petersson, Stig A.; and Eriksson, Bengt S., 4,204,861, Cl. 75-73.000.

Bolie, Victor W. Vertical axis wind turbine. 4,204,805, Cl. 416-119.000.

Bolt, Richard A. Implantable artificial sphincter. 4,204,282, Cl. 3-1.000.

Bonnamour, Yves B., to Southwire Company. Method of prolonging the life of a rotary casting machine band. 4,204,568, Cl. 164-87.000.

Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., to Carborundum Company, The. Fuel ignitor comprising a novel silicon carbide composition. 4,205,363, Cl. 361-264.000.

Borg-Warner Corporation: *See*—
Cohen, Murray S.; Noltes, Jan G.; and van Koten, Gerard, 4,205,191, Cl. 585-250.000.

Borneman, Lawrence A., to A. B. Dick Company. Duplexing copying system. 4,204,472, Cl. 101-426.000.

Borodin, Ivan V.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V., 4,204,910, Cl. 176-30.000.

Bortzfield, Jon L.: *See*—
Loker, W. Aleck; Bortzfield, Jon L.; Chard, Steven D.; Hall, John W.; and Meredith, John T., 4,204,589, Cl. 192-27.000.

Bosco, Armand, to Garrett Corporation, The. Bearing assembly. 4,204,718, Cl. 308-15.000.

Bosman, Aleidus G. Spooling machine. 4,204,649, Cl. 242-43.00R.

Boston, David R., to Minnesota Mining and Manufacturing Company. Salt compound comprised of a ferricyanide anion and a protonated nitrogen-substituted hydrocarbon compound cation, and a stable solution thereof. 4,204,868, Cl. 430-461.000.

Bott, John P., to United States of America, Navy. Dual speed fluid control apparatus. 4,204,552, Cl. 137-81.00A.

Botthof, Ferdinand: *See*—
Westernacher, Helmut; Schimpff, Peter; and Botthof, Ferdinand, 4,205,045, Cl. 422-192.000.

Bouchou, Paul; Nigoghossian, Claude; and Sillioc, Guy, to Compagnie d'le Electronique et de Piezo-Electricite. Electrical frequency filter comprising piezoelectric crystals. 4,205,284, Cl. 333-189.000.

Boulton, Thomas W.; and Darwent, Brian J., to Imperial Chemical Industries Limited. Diaphragm cell. 4,204,939, Cl. 204-258.000.

Bourcet, Patrice: *See*—
Pujolle, Jean; and Bourcet, Patrice, 4,204,432, Cl. 73-599.000.

Bouy, Pierre: *See*—
Bachot, Jean; Bouy, Pierre; and Juillard, Michel, 4,204,938, Cl. 204-252.000.

Bowden, Alan P., to M. Hamburger & Sons, Inc. Cement coloring composition and method of producing same. 4,204,876, Cl. 106-90.000.

Bowden, Roy D.; and Seaton, Thomas, to Imperial Chemical Industries Limited. Chlorination process. 4,205,175, Cl. 546-345.000.

Bowling, William M. Fuel delivery system. 4,204,506, Cl. 123-137.000.

Boyle, Malachy V.; and Ouyang, Mid, to General Electric Company. Bus structure comprising an insulating support and a coated electric bus bar. 4,205,198, Cl. 174-171.000.

Braad, Poul E.; Jensen, Knud B.; Rosendal, Hans; and Sevaldsen, Flemming, to Aktieselskabet Nordiske Kabel-og Traadfabriker. Process and apparatus for continuously transforming a strip to an elongated pipe. 4,204,415, Cl. 72-52.000.

Bradley, Virginia R. Sock. 4,204,345, Cl. 36-97.000.

Brammerlo, Allen A., to General Electric Company. Prime mover and methods. 4,205,247, Cl. 310-256.000.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,204,717, Cl. 308-6.00C.

Branzburg, Elena Z.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Braud, Societe Anonyme: *See*—
Delfosse, Gilbert, 4,204,389, Cl. 56-330.000.

Braytenbah, Andrew, to Westinghouse Electric Corp. System and method for operating a steam turbine with digital computer control with accelerating setpoint change. 4,205,380, Cl. 364-494.000.

Breger, Alexandr K.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Breguet, Jean-Luc, to Ebauches S.A. Watch. 4,204,396, Cl. 368-287.000.

Brenholt, David L., to Donaldson Company, Inc. Self-cleaning air filter. 4,204,846, Cl. 55-272.000.

Brenner, Abner. Mounting for photographs or the like. 4,204,350, Cl. 40-155.000.

Brenner, John A.: *See*—
Brueggemann, Walter H.; and Brenner, John A., 4,205,028, Cl. 264-24.000.

Brewster, Robert W.: *See*—
Warren, Lyle D.; and Brewster, Robert W., 4,204,798, Cl. 414-750.000.

Bridges, Stuart A., to Rolls-Royce Limited. Brush seal and a method of manufacture. 4,204,629, Cl. 228-160.000.

Bridgestone Tire Company Limited: *See*—
Ohashi, Takashi; Kojima, Minoru; Yoshida, Masako; Okuyama, Toru; and Sakata, Ryozo, 4,205,136, Cl. 521-118.000.

Bridoux, Edouard; Bruneel, Christian; Haine, Francis; and Thomin, Guy, to Agence Nationale de Valorisation de la Recherche (ANVAR). Devices using ultrasounds for forming images, in particular for the internal examination of the human body. 4,204,435, Cl. 73-626.000.

Bridwell, Glenn D.; Maule, James; Schrombeck, Alois; and Wognum, Willis, to WSBM Company, Inc. Boat washing apparatus. 4,204,494, Cl. 114-222.000.

Briggs, Donald L. Aluminum model airplane kit. 4,204,358, Cl. 46-76.00R.

Briggs, Kenneth: *See*—
Stables, Harry C.; and Briggs, Kenneth, 4,205,165, Cl. 544-20.000.

British Industrial Plastics Ltd.: *See*—
Hewitt, Malcolm, 4,204,822, Cl. 425-210.000.

British Petroleum Company Limited, The: *See*—
Gane, Brian R.; and Stewart, David G., 4,205,190, Cl. 568-902.000.

Britton, Wayne E.; and Krumpelt, Michael, to BASF Wyandotte Corporation. Method for rejuvenating chlor-alkali cells. 4,204,921, Cl. 204-98.000.

Brock, Horace T., Jr. Cylinder deactivator system. 4,204,512, Cl. 123-198.00F.

Broken Hill Propietary Company Limited, The: *See*—
Fraser, Donald B.; Dim, Alexander; Anthony, Kevin E.; Costello, Wayne R.; and Grazier, Phillip E., 4,204,922, Cl. 204-105.00R.

Brons, Albert J.: *See*—
Lincicome, Thomas N.; Spiro, John M.; and Brons, Albert J., 4,204,707, Cl. 285-114.000.

Brooks, Cecilia H. Reading skills development kit. 4,204,343, Cl. 35-73.000.

Brown Company: *See*—
Lancelot, Harry B., III; and Macrobbie, Robert M., 4,204,711, Cl. 294-89.000.

Brown, Floyd E. Method and apparatus for outdoor tossing game. 4,204,682, Cl. 273-401.000.

Brueggemann, Walter H.; and Brenner, John A., to Ferro Corporation. Forming protective skin on intricately molded product. 4,205,028, Cl. 264-24.000.

Bruel, Alain. Harvesting machine. 4,204,390, Cl. 56-330.000.

Bruggemann & Brand KG: *See*—
Rothaemel, Gunther; and Fengels, Gerd, 4,204,710, Cl. 294-77.000.

Bruneel, Christian: *See*—
Bridoux, Edouard; Bruneel, Christian; Haine, Francis; and Thomin, Guy, 4,204,435, Cl. 73-626.000.

Bruneel, Jean L.: *See*—
Micheron, Francois; Bruneel, Jean L.; and Leclerc, Pierre, 4,205,242, Cl. 307-400.000.

Bryan, John F., Jr., to Pyramid Manufacturing Company. Winch mechanism for crane. 4,204,664, Cl. 254-175.700.

Bryant, Cal L.: *See*—
Wynn, Edward J.; and Bryant, Cal L., 4,204,792, Cl. 414-36.000.

Brydon, Donald L., to Imperial Chemical Industries Limited. Process for producing shaped articles of polyoxadiazoles. 4,205,038, Cl. 264-184.000.

Budd Company, The: *See*—
Whitsel, Jay F., 4,204,434, Cl. 73-622.000.

Buhler, Ernst: *See*—
Ullmann, Werner; Buhler, Ernst; Kilcher, Beat; Ruh, Herbert; and Sieg, Arno, 4,205,212, Cl. 219-69.00W.

Bullard, James: *See*—
Lester, Frank R.; and Bullard, James, 4,204,292, Cl. 15-28.000.

Bullock, Norman J., to W. M. Cissell Manufacturing Company, The. Laundry dryer. 4,204,338, Cl. 34-35.000.

Bundy, Gordon L., to Upjohn Company, The. Trans-2,3,13,14-tetradehydro-9-deoxy-9-methylene-PGF compounds. 4,205,179, Cl. 560-121.000.

Bunker Ramo Corporation: *See*—
Krolak, Ronald F., 4,204,740, Cl. 339-90.00R.
Makuch, John A., 4,204,306, Cl. 29-281.500.

Burda, Robert E.: *See*—
Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., 4,204,575, Cl. 172-1.000.

Burford, Henry H. T., Jr., to Sortex North America, Inc. Produce grading system using two visible and two invisible colors. 4,204,950, Cl. 209-558.000.

Burger, Anthony J., Jr., to Johns-Manville Corporation. Dollie for manipulating a palletized load and method of its use. 4,204,696, Cl. 280-79.10R.

Burk, Emmett H., Jr.: *See*—
Yoo, Jin S.; Burk, Emmett H., Jr.; and Karch, John A., 4,204,840, Cl. 44-1.0SR.

Burkhardt, Charles E.: *See*—
Lin, Kou C.; Ellis, Belvin B.; and Burkhardt, Charles E., 4,205,288, Cl. 336-5.000.

Burley, James D.: *See*—
Holland, Warren E.; Burley, James D.; and Arendt, Henry P., 4,204,690, Cl. 277-27.000.

Burress, George T.: *See*—
Young, Lewis B.; and Burress, George T., 4,205,189, Cl. 568-768.000.

Burroughs Wellcome Co.: *See*—
Almeida, June D., 4,205,131, Cl. 435-235.000.

Buscher, David J.; and Schneider, Marvin J., to United States of America, Army. Binary integrator for fixed cell radar alarm data. 4,205,382, Cl. 364-516.000.

Business Efficiency Aids, Inc.: *See*—
Hawkins, Graham S. W., 4,204,351, Cl. 40-372.000.

Butler County Mushroom Farm, Inc.: *See*—
Maul, Stephen B.; Lemke, Paul A.; Gerner, Walter L.; and Yoder, John B., 4,204,364, Cl. 47-1.100.

Butler, Gene R.: *See*—
Barton, Lester C.; Butler, Gene R.; and Butler, L. Dennis, 4,204,791, Cl. 414-36.000.

Butler, L. Dennis: *See*—
Barton, Lester C.; Butler, Gene R.; and Butler, L. Dennis, 4,204,791, Cl. 414-36.000.

Butterfield, Roy, to National Research Development Corporation. Apparatus for moving along or through a material. 4,205,362, Cl. 361-234.000.

Butterworth, Dennis: *See*—
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,205,067, Cl. 424-114.000.

Byers, Charles H.; Hausslein, Robert W.; and Nestle, Mara O., to Polaroid Corporation. Method for forming noble metal silver precipitating nuclei. 4,204,869, Cl. 430-564.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Schoetensack, Wolfgang; and Riedel, Richard, 4,205,088, Cl. 424-319.000.

Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., to Owens-Illinois, Inc. Gas discharge display device. 4,205,392, Cl. 365-116.000.

Cailliot, Serge, to Societe Normande de Services; Agence Nationale de Valorisation de la Recherche (ANVAR); Societe Generale pour le Financement de l'Innovation, Soginnove; Cor, Bertrand; and Gastinne, Arnaud, part interest to each. Continuous centrifugal filter for various filtering and automatic coffee making. 4,204,964, Cl. 210-370.000.

Cale, Roland E., to Schaefer Equipment Incorporated. Brake-rod jaw with twisted forks. 4,204,419, Cl. 72-356.000.

California Controls Company: *See*—
Bilbrey, Robert A.; Munroe, William O.; and Powell, David G., 4,204,513, Cl. 123-198.0DB.

California Institute of Technology: *See*—
Feldstein, Cyril; Lewis, Gilbert W.; and Culler, Virgil H., 4,204,544, Cl. 128-642.000.

Calvert, Scott A., to Owens-Corning Fiberglas Corporation. Moldings for articles. 4,204,376, Cl. 52-309.100.

Calvino, Ben J., to Westinghouse Electric Corp. Double-flow compressed-gas operating mechanism for a high-voltage circuit-breaker. 4,205,208, Cl. 200-82.00R.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Ward, Frederick D., 4,204,456, Cl. 89-1.50G.

Canney, Robert S.; Ouellette, Ronald J.; and Morong, William H., Jr., to General Electric Company. Transformer construction. 4,205,290, Cl. 336-90.000.

Cannon, Raymond E., to IMED Corporation. Cassette for intravenous controller. 4,204,538, Cl. 128-214.00R.

Canon Denshi Kabushiki Kaisha: *See*—
Tanaka, Fumio; and Toshimitsu, Naohiko, 4,205,356, Cl. 360-118.000.

Canon Kabushiki Kaisha: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Hashimoto, Teiji, 4,204,762, Cl. 354-242.000.
Goshima, Yoshitomo; Kawakubo, Kazuo; Furuichi, Katsushi; Sakamaki, Hisashi; Sawamura, Osamu; Komiya, Yutaka; and Tomosada, Masahiro, 4,204,728, Cl. 355-4.000.
Shimizu, Masami; and Hashimoto, Teiji, 4,205,287, Cl. 335-271.000.
Tanaka, Fumio; and Toshimitsu, Naohiko, 4,205,356, Cl. 360-118.000.

Canterino, Peter J.; and Arbit, Harold A., to Mobil Oil Corporation. Heat and grease resistant containers comprising poly (p-methylstyrene). 4,205,114, Cl. 428-315.000.

CarboMedics, Inc.: *See*—
Bokros, Jack C.; Shim, Hong S.; and Haubold, Axel D., 4,204,542, Cl. 128-335.500.

Carborundum Company, The: *See*—
Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., 4,205,363, Cl. 361-264.000.
Korklan, Harris J.; and Greany, John K., 4,204,907, Cl. 162-135.000.

Cardenas, Jorge N.; and Reichle, Walter T., to Union Carbide Corporation. Process for preparing p,p'-biphenol of high purity. 4,205,187, Cl. 568-730.000.

Carl Freudenberg, Firma: *See*—
Schmidt, Klaus; and Hoffmann, Harald, 4,205,108, Cl. 428-147.000.

Carley-Macauly, Kenneth W.: *See*—
Hodgson, Thomas D.; Carley-Macauly, Kenneth W.; and Smith, Sidney, 4,204,953, Cl. 210-58.000.

Carlson, Dana P., to Du Pont de Nemours, E. I., and Company. Cross-linking of esterified fluorocarbon polymer. 4,204,927, Cl. 204-159.180.

Carlson, Harold W. Door latch assembly. 4,204,708, Cl. 292-292.000.

Carpenter, Neil L. Method and apparatus for recovery of hydrocarbons from tar-sands. 4,204,923, Cl. 204-129.000.

Carpenter, Peter G., deceased: *See*—
Hayati, Hossein; Towers, Russell S.; and Carpenter, Peter G., deceased, 4,204,872, Cl. 106-38.350.

Carr, John B., to Shell Oil Company. 2,3-Dihydro benzofuran carboxamides. 4,205,080, Cl. 424-275.000.

Carr, John B.: *See*—
Durham, Harry G.; and Carr, John B., 4,205,076, Cl. 424-270.000.
Durham, Harry G.; and Carr, John B., 4,205,079, Cl. 424-275.000.

Carriere, Donald L., to Ford Motor Company. Constant velocity universal joint. 4,204,412, Cl. 64-17.00R.

Cartaya, Oscar A. Serum-free cell culture media. 4,205,126, Cl. 435-2.000.

Carter, William L.; Greathouse, Jack F.; and Zeilinger, Philip T., to Garrett Corporation, The. Fluid pumping system. 4,204,811, Cl. 417-288.000.

Carty, Jack. Stack design. 4,204,463, Cl. 98-58.000.

Casey, Gary L.; and Hurlong, Granville, Jr., to Bendix Corporation, The. Fuel electric fuel injection valve. 4,204,507, Cl. 123-139.0AW.

Caterpillar Tractor Co.: *See*—
Johnson, Howard L., 4,204,459, Cl. 91-445.000.
Stedman, Robert N., 4,204,578, Cl. 172-307.000.

Celanese Corporation: *See*—
Izumi, Yusuke; Maekawa, Junji; and Suzuki, Katsumi, 4,205,182, Cl. 560-247.000.

Celotex Corporation, The: *See*—
Beale, John H.; and Moss, Ernest K., 4,205,135, Cl. 521-116.000.

Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych KOMAG: *See*—
Jedo, Antoni; and Jachna, Waclaw, 4,204,949, Cl. 209-250.000.

Centre de Recherches Metallurgiques Centrum voor Research in de Metallurgie: *See*—
Economopoulos, Marios, 4,204,892, Cl. 148-145.000.

CentreElectronique Horologer S.A.: *See*—
Darwish, Mougahed Y.; and Oguey, Henri J., 4,205,342, Cl. 357-23.000.

Centrodyne Corporation: *See*—
Steiner, Jack, 4,205,388, Cl. 364-900.000.

Century Electric Motor Co.: *See*—
Shoenleben, Alden W., 4,204,739, Cl. 339-75.00R.

Chahroudi, Day, to Heat Mirror Associates. Apparatus for multilayer thin film deposition. 4,204,942, Cl. 204-298.000.

Champion International Corporation: *See*—
Hart, John R.; Lare, Donald W.; and Nault, James J., 4,205,025, Cl. 264-14.000.
Pritchard, Sheldon S., 4,204,600, Cl. 206-610.000.

Chan, David C. K., to Chevron Research Company. N-Carbamylalkyl-2,6-dialkyl-α-haloacetanilides. 4,205,168, Cl. 544-165.000.

Chang, Leroy L.: *See*—
Esaki, Leo; Sai-Halasz, George A.; and Chang, Leroy L., 4,205,331, Cl. 357-30.000.

Chang, Peter J. Y. Adjustable safety guide for skeleton type caulking gun. 4,204,616, Cl. 222-391.000.

Chang, Wen-Hsuan: *See*—
Piccirilli, Robert M.; Chang, Wen-Hsuan; McKeough, David T.; and Porter, Samuel, Jr., 4,205,115, Cl. 428-334.000.

Chapman, Derek D.; and Wu, E-ming, to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible heterocyclyazonaphthol dye-releasing compounds. 4,204,870, Cl. 430-213.000.

Chapman, Derek D., to Eastman Kodak Company. Nondiffusible 6-arylazo-2-amino-3-pyridinol dye-releasing compounds. 4,204,993, Cl. 260-156.000.

Chaput, Bertha E. Bassinette toy. 4,204,361, Cl. 46-116.000.

Chard, Steven D.: *See*—
Loker, W. Aleck; Bortzfield, Jon L.; Chard, Steven D.; Hall, John W.; and Meredith, John T., 4,204,589, Cl. 192-27.000.

Chemed Corporation: *See*—
Jacob, Jose T., 4,204,954, Cl. 210-59.000.

Chemische Werke Buls A.G.: *See*—
Westernacher, Helmut; Schimpff, Peter; and Botthof, Ferdinand, 4,205,045, Cl. 422-192.000.

Chen, James L.: *See*—
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,204,540, Cl. 128-283.000.

Chenel, Pierre, to Saint Gobain Industries. Multiple pane window having a thick seal and a process and apparatus for applying the seal. 4,205,104, Cl. 428-34.000.

Chetverikov, Vladimir N.: *See*—
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

Chevron Research Company: *See*—
Chan, David C. K., 4,205,168, Cl. 544-165.000.
Flanders, Robert L.; and Blanton, William A., Jr., 4,204,944, Cl. 208-120.000.
Flanders, Robert L.; and Blanton, William A., Jr., 4,204,945, Cl. 208-120.000.
Jacobson, Robert L.; and Gibson, Kirk R., 4,204,947, Cl. 208-243.000.
Piehl, Robert L.; and Scarborough, W. Bertram, 4,205,050, Cl. 423-228.000.
Pyle, Walter R., 4,204,563, Cl. 141-206.000.

Chiavarotti, Gian P.: *See*—
Conti, Mario; Chiavarotti, Gian P.; and Luciani, Sandro, 4,205,332, Cl. 357-34.000.

Chinoin Gyogyszes es Begyeszeti Termekek Gyara Rt.: *See*—
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.

Chooljian, Leo; and Chooljian, Mehran. Apparatus for removing mold and other detritus from raisins and the like. 4,204,291, Cl. 15-3.100.

Chooljian, Mehran: *See*—
Chooljian, Leo; and Chooljian, Mehran, 4,204,291, Cl. 15-3.100.

Chorvat, Robert J., to D. G. Searle & Co. 25-Alkylcholest-5-ene-3β,22-diols and esters thereof. 4,205,004, Cl. 260-397.200.

Christensen, Jan A.: *See*—
Almqvist, Kent R.; Christensen, Jan A.; Alfheim, Roar L.; and Torgersen, Lars, 4,205,031, Cl. 264-40.400.

Christiansen, Preben: *See*—
Andersen, Hans S.; and Christiansen, Preben, 4,204,460, Cl. 91-447.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; and Sasaki, Kanemichi, 4,205,081, Cl. 424-279.000.

Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V. Method of rolling section billets. 4,204,416, Cl. 72-204.000.

Church, Walter E. Phonograph record protective cushion. 4,204,686, Cl. 274-1.00R.

Ciba-Geigy Corporation: *See*—
Aufderhaar, Ernst; Gallay, Jean J.; Kuhne, Manfred; Meyer, Alfred; Rechsteiner, Oswald; Schellenbaum, Max; and Fumeaux, Jean-Paul, 4,205,077, Cl. 424-273.00B.
Ferrini, Pier G., 4,205,082, Cl. 424-281.000.
Gremmelmaier, Claude; and Riethmann, Jean, 4,205,167, Cl. 544-209.000.

Ciba-Geigy Limited: *See*—
Hodgson, Thomas D.; Carley-Macauly, Kenneth W.; and Smith, Sidney, 4,204,953, Cl. 210-58.000.

Cich, Frank A.; Glazer, Emmett J.; and Smith, Edwin S., to Goodyear Tire & Rubber Company, The. Method of removing vinyl chloride monomer from polyvinyl chloride resins. 4,205,149, Cl. 526-89.000.

Cicin-Sain, Ivo, to Matisa Materiel Industriel S.A. Mobile device for renewal of railway tracks. 4,204,476, Cl. 104-2.000.

Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., to E. R. Squibb & Sons, Inc. Ostomy composition. 4,204,540, Cl. 128-283.000.

Cincinnati Milacron Chemicals Inc.: *See*—
Zestermann, Mary J.; and Hussar, John F., 4,205,176, Cl. 548-239.000.

Cisco, Thomas F.; Hansen, George E.; and Agate, Robert N., to Stauffer Chemical Company. Process for recovering acid chlorides by distillation. 4,204,916, Cl. 203-6.000.

Cislak, Raymond S.; and Romanzi, Louis, Jr., to Gateway Industries, Inc. Retractor with a cover attached to a slide plate. 4,204,652, Cl. 242-107.40R.

Citizen Watch Co., Ltd.: *See*—
Yamada, Shigetaka, 4,204,874, Cl. 106-73.400.

Clark, David W., to PVI Industries, Inc. Heat exchanger with concentric flow tubes. 4,204,573, Cl. 165-142.000.

Clark Equipment Company: *See*—
Tallis, Thomas J., 4,204,349, Cl. 37-141.0RS.

Clarke, John R. P.: *See*—
Atherton, John H.; Dobson, Derrick C.; Hodgkinson, Ian; and Clarke, John R. P., 4,204,838, Cl. 23-230.00R.

Classic Corporation: *See*—
Fogel, Isaac, 4,204,289, Cl. 5-451.000.

Clausing, Challiss I, to Gould Inc. Draw out circuit breaker assembly. 4,205,207, Cl. 200-50.0AA.

Clayton, Hadwen A.: *See*—
Reese, Herbert E.; and Clayton, Hadwen A., 4,204,808, Cl. 417-2.000.

Clayton, James W. B.; and Clough, Douglas O., to Platt Saco Lowell Limited. Open end spinning machine frame construction. 4,204,391, Cl. 57-1.00R.

Clenney, Richard W. Telephone loop extending apparatus. 4,205,204, Cl. 179-16.00F.

Clifford, David P., to Dow Chemical Company Limited. Preparation of O,O-dialkyl phthalimido-phosphonothioate. 4,204,996, Cl. 260-326.00E.

Clifford, Peter P.: *See*—
Leger, Donald R.; Clifford, Peter P.; and Matson, William N., 4,204,803, Cl. 415-219.00R.

CLM International Corp.: *See*—
Mack, Jack E.; and Mack, Patrick K., 4,204,968, Cl. 252-26.000.

Clough, Douglas O.: *See*—
Clayton, James W. B.; and Clough, Douglas O., 4,204,391, Cl. 57-1.00R.

Cobe Laboratories, Inc.: *See*—
Lobdell, Donn D.; Herman, Stephen J.; and Giurtino, Joel F., 4,205,042, Cl. 422-47.000.

Cochrane, William. Cervical collar apparatus. 4,204,529, Cl. 128-75.000.

Cohen, Murray S.; Noltes, Jan G.; and van Koten, Gerard, to Borg-Warner Corporation. Hydrocarbon hydrogenation using zero valent metal catalysts. 4,205,191, Cl. 585-250.000.

Cohen, Noal, to Hoffmann-La Roche Inc. Inversion process. 4,205,001, Cl. 260-345.500.

Cole, Graham M., to Dreamland Electrical Appliances Limited. Heating circuits for detection of localized overheating. 4,205,223, Cl. 219-501.000.

Cole, Martin; Hood, John D.; and Butterworth, Dennis, to Beecham Group Limited. Antibiotics. 4,205,067, Cl. 424-114.000.

Coll-Palagos, Miguel, to Stauffer Chemical Company. Recovery of phosphorus from sludge. 4,204,925, Cl. 204-152.000.

Column Corporation: *See*—
Hopp, Leo A., 4,204,645, Cl. 239-341.000.

Combustion Engineering, Inc.: *See*—
Giuggio, Nicholas; Noyes, Richard C.; and Zaman, Shakir U., 4,204,909, Cl. 176-22.000.
Warren, Kenneth W.; and Prestridge, Floyd L., 4,204,934, Cl. 204-186.000.

Commissariat a l'Energie Atomique: *See*—
Forestier, Jean; Leblanc, Bernard; Monteil, Marcel; and Monteil, Pierre, 4,204,502, Cl. 122-32.000.
Plaige, Yves, 4,205,240, Cl. 307-350.000.

Compagnie d'le Electronique et de Piezo-Electricite: *See*—
Bouchou, Paul; Nigoghossian, Claude; and Sillioc, Guy, 4,205,284, Cl. 333-189.000.

Compagnie Generale d'Electricite: *See*—
LeGoff, Denis, 4,205,225, Cl. 250-229.000.

Compagnie Generale des Etablissements Michelin: *See*—
Lefrancois, Jean, 4,204,309, Cl. 29-412.000.

Compagnie Internationale pour l'Informatique: *See*—
Lazzari, Jean-Pierre; and Helle, Michel, 4,204,315, Cl. 29-603.000.
Morizot, Henri; and Lucan, Andre, 4,205,120, Cl. 428-676.000.

Computer Kinetics Corporation: *See*—
Nelson, Jack P., 4,205,312, Cl. 340-792.000.

Conard, William A.: *See*—
Ravn, Jacob; and Conard, William A., 4,204,605, Cl. 215-295.000.

Cone, Richard E., to Questor Corporation. Plant pot holder or reservoir. 4,204,367, Cl. 47-71.000.

Conoco, Inc.: *See*—
Stalder, John L., 4,204,574, Cl. 166-305.00R.

Conti, Mario; Chiavarotti, Gian P.; and Luciani, Sandro, to SGS-Ates Componenti Elettronici S.p.A. Quick-quenching power transistor. 4,205,332, Cl. 357-34.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Johannes, Gunter; and Pfeiffer, Hans-Dieter, 4,204,567, Cl. 152-209.00D.

Cook, Hulet H. Mail depository indicating assembly. 4,204,632, Cl. 232-34.000.

Cook, Kenneth J.: *See*—
Ruszala, Frederick B.; and Cook, Kenneth J., 4,205,386, Cl. 364-607.000.

Cooper, Donald L.: *See—*
Fox, Marvin; Cooper, Donald L.; and Warren, Walter B., 4,205,379, Cl. 364-432.000.
Cooper, Martin H., to Westinghouse Electric Corp. Method and apparatus for removing iodine from a nuclear reactor coolant. 4,204,911, Cl. 176-37.000.
Cor, Bertrand: *See—*
Cailliot, Serge, 4,204,964, Cl. 210-370.000.
Cornelius, Gail, to R. M. Wade & Co. Sprinkler leveler and wind compensating device. 4,204,643, Cl. 239-212.000.
Cornell Research Foundation, Inc.: *See—*
Mattick, Leonard R.; and Gogel, Edward V., 4,205,092, Cl. 426-271.000.
Corning Glass Works: *See—*
Dominick, Ellen K.; and Scherer, George W., 4,204,850, Cl. 65-3.00A.
Nolan, Daniel A., 4,204,851, Cl. 65-3.00A.
Cornwell Components Limited: *See—*
Cornwell, John V., 4,204,344, Cl. 36-34.00A.
Cornwell, John V., to Cornwell Components Limited. Shoe heels. 4,204,344, Cl. 36-34.00A.
Corron, Donald C.; and Tallent, Glen, Jr., to Greentex Incorporated. Strand handling system and method therefor. 4,204,301, Cl. 28-248.000.
Costello, Wayne R.: *See—*
Fraser, Donald B.; Dim, Alexander; Anthony, Kevin E.; Costello, Wayne R.; and Grazier, Phillip E., 4,204,922, Cl. 204-105.00R.
Cotoara, Dumitru: *See—*
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Coulter Systems Corporation: *See—*
Kuehnle, Manfred R.; Martinez, Ferdinand; and Ignasiak, Stanley F., 4,204,865, Cl. 430-30.000.
Courtois, Bernard, to Societe Industrielle Bertrand Faure. Seat-supporting slides. 4,204,658, Cl. 248-430.000.
Cox, Herbert M., to Bell Telephone Laboratories, Incorporated. Process for depositing chrome doped epitaxial layers of gallium arsenide utilizing a preliminary formed chemical vapor-deposited chromium oxide dopant source. 4,204,893, Cl. 148-175.000.
Crafco, Inc.: *See—*
Jacobson, Carl C.; and Crosby, Gaius P., 4,204,714, Cl. 299-1.000.
Craig, James R.; and Otto, George W., Jr., to Raytheon Company. Automatic bucky lock. 4,205,233, Cl. 250-439.00R.
Craig, Roger A.; and Pritchard, Huw O., to United States of America, National Aeronautics and Space Administration. Reduction of nitric oxide emissions from a combustor. 4,204,402, Cl. 60-39.060.
Craighead, James W. Indicia forming multiple die. 4,204,470, Cl. 101-28.000.
Creusot-Loire: *See—*
Ducreuzet, Jean, 4,204,603, Cl. 212-49.000.
Creusot-Loire Enterprises: *See—*
Schulz, Herbert, 4,204,431, Cl. 73-423.00R.
Cribbs, Robert W.; and Mahony, John E., to Litton Industrial Products, Inc. Computerized ultrasonic scanner with technique-select. 4,204,433, Cl. 73-620.000.
Crosby, Gaius P.: *See—*
Jacobson, Carl C.; and Crosby, Gaius P., 4,204,714, Cl. 299-1.000.
Crouzet, Pierre A. Method of forming a product for use as a concrete substitute. 4,204,988, Cl. 260-29.60S.
Crumrine, John C.: *See—*
Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., 4,204,575, Cl. 172-1.000.
Cruz, Mamerto M., Jr., to Avicon, Inc. Method for preparing pyrogen free collagen. 4,204,992, Cl. 260-123.700.
Culler, Virgil H.: *See—*
Feldstein, Cyril; Lewis, Gilbert W.; and Culler, Virgil H., 4,204,544, Cl. 128-642.000.
Cunningham, James D.: *See—*
Smith, James E.; and Cunningham, James D., 4,204,622, Cl. 227-7.000.
Cunningham, John: *See—*
Feltz, Edward J.; and Cunningham, Ross, 4,204,973, Cl. 252-181.000.
Cunningham, Ross: *See—*
Feltz, Edward J.; and Cunningham, Ross, 4,204,973, Cl. 252-181.000.
Cusato, John, Jr. Filter apparatus with cleaning function. 4,204,961, Cl. 210-232.000.
Cutter Laboratories, Inc.: *See—*
Morin, Marius J.; Nichols, Colin J.; and Prouty, Myron R., 4,204,604, Cl. 215-257.000.
Cyrot, Luc P., to Parker-Hannifin Corporation. Device for controlling hydraulic motors. 4,204,457, Cl. 91-31.000.
D. G. Searle & Co.: *See—*
Chorvat, Robert J., 4,205,004, Cl. 260-397.200.
Daahn, Gahn, to Bayer Aktiengesellschaft. Perspiration-inhibiting soaps. 4,205,062, Cl. 424-66.000.
Dabrio, John W. Fuel heating, air metering valve unit for engine air inlet system. 4,204,504, Cl. 123-119.00B.
Daftary, Shashikumar H.: *See—*
Streetman, William E.; and Daftary, Shashikumar H., 4,205,039, Cl. 264-206.000.
Dahlke, Charles J., to Rosemount Inc. Two wire current transmitter with adjustable current control linearization. 4,205,327, Cl. 340-208.000.
Daicel Ltd.: *See—*
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.
Dailey, Larry R.: *See—*
Neubert, Hans D.; Dailey, Larry R.; and Robinson, Richard S., 4,204,323, Cl. 433-38.000.
Dale, James A.; and Ng, Steve Y. W., to Dynapol. Polymeric N-substituted maleimide antioxidants. 4,205,151, Cl. 526-262.000.
Damour, Lawrence R. Pivoted web guide for travelling strip. 4,204,619, Cl. 226-21.000.
Danfoss A/S: *See—*
Andersen, Hans S.; and Christiansen, Preben, 4,204,460, Cl. 91-447.000.
Kirbis, Manfred; Schilde, Peter; and Englmaier, Gert, 4,204,318, Cl. 29-734.000.
Danial, Naguib F. Ellipse compass. 4,204,327, Cl. 33-30.00F.
Dardick, David. Gas generating charge for open chamber gas powered tool. 4,204,473, Cl. 102-39.000.
Darwent, Brian J.: *See—*
Boulton, Thomas W.; and Darwent, Brian J., 4,204,939, Cl. 204-258.000.
Darwish, Mougahed Y.; and Oguey, Henri J., to CentreElectronique Horologer S.A. Integrated circuit structure having regions of doping concentration intermediate that of a substrate and a pocket formed therein. 4,205,342, Cl. 357-23.000.
Data General Corporation: *See—*
Gruner, Ronald H., 4,205,372, Cl. 364-200.000.
Datafile Limited: *See—*
Barber, Donald T.; and Scrymgeour, Thomas C., 4,204,639, Cl. 235-462.000.
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Hashimoto, Teiji, to Canon Kabushiki Kaisha. Centrifugal brakes for focal plane shutters. 4,204,762, Cl. 354-242.000.
David Brown Tractors Limited: *See—*
Jones, Maurice, 4,204,487, Cl. 123-41.350.
Davidson, James D. Compressed expandable insulation tape and method. 4,204,373, Cl. 52-204.000.
Davis, Frank E., to Smith, Robert E. Bottle carrier. 4,204,596, Cl. 206-203.000.
Davis, John A. Eyeglass frame with temple adjusting braces. 4,204,749, Cl. 351-123.000.
Davis, Joseph P.; and Nagy, Julius S., to Goodyear Tire & Rubber Company, The. Process using same stable foam latex with built-in self gel mechanism and coating. 4,205,103, Cl. 427-373.000.
Davis, M. Lewis, to Sealed Power Corporation. Oil control ring spacer-expander with improved slip latch. 4,204,688, Cl. 277-9.000.
Davis, William D., to General Electric Company. Electrode structure for halogen leak detector. 4,205,249, Cl. 313-30.000.
Dawson, Frank, to Qualcast (Lawn Mowers) Limited. Air cushion mowers. 4,204,388, Cl. 56-320.100.
Dawson, Peter, to Tweedy of Burnley Limited. Vacuum cooling. 4,204,408, Cl. 62-62.000.
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van der Houwen, Derk; and Wilcke, Robert, 4,205,345, Cl. 358-168.000.
DeBenedictis, Leonard C.; and Johnson, Richard V., to Xerox Corporation. Laser scanning utilizing facet tracking and acousto pulse imaging techniques. 4,205,348, Cl. 358-285.000.
de Bruyne, Norman A. Synchronous stirrer. 4,204,774, Cl. 366-102.000.
Dederichs, Knut: *See—*
Kreuzburg, Eberhard; Eichholz, Gunter; and Dederichs, Knut, 4,204,959, Cl. 210-195.100.
Defibrator Aktiebolag: *See—*
Johansson, Inge, 4,204,689, Cl. 277-27.000.
de Geus, Arie M. Horizontal wind powered reaction turbine electrical generator. 4,204,799, Cl. 415-2.000.
Deichelmann, Hermann: *See—*
Henkler, Herbert; Koenig, Roland; Deichelmann, Hermann; and Koch, Volker, 4,205,393, Cl. 365-133.000.
Dela Cruz, Luis B. Precision gravity responsive angle indicator. 4,204,334, Cl. 33-391.000.
Delfosse, Gilbert, to Braud, Societe Anonyme. Machine for harvesting in-line crops. 4,204,389, Cl. 56-330.000.
D'Elia, Robert V.: *See—*
Bartell, Jeffrey M.; and D'Elia, Robert V., 4,204,897, Cl. 156-155.000.
Del Prete, Cosimo; and Ferraro, Michael V. Open end one way torque wrench. 4,204,440, Cl. 81-111.000.
de Maight, Winfried, to Zahnradfabrik Friedrichshafen, AG. Fluid supply system for auxiliary power steering having pressure storage means. 4,204,584, Cl. 180-133.000.
DEMATEX Development & Investment Establishment: *See—*
Micheli, Antoine, 4,204,606, Cl. 215-307.000.
Dempsey, Martin E.; and Lee, Ching W., to GTE Laboratories Incorporated. Acoustic surface wave device. 4,205,285, Cl. 333-194.000.
Den-Mat, Inc.: *See—*
Ibsen, Robert L.; Glace, William R.; and Reed, William R., Jr., 4,204,978, Cl. 252-408.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Ishimatsu, Yoshiaki; Shigesada, Shigeki; Suzuki, Hiroyasu; Kitagawa, Hironoshin; and Kimura, Shoji, 4,205,128, Cl. 435-182.000.
Marubashi, Kiyonobu, 4,205,150, Cl. 526-252.000.

deNora, Oronzio: *See—*
Bianchi, Giuseppe; deNora, Oronzio; and Spaziante, Placido M., 4,204,937, Cl. 204-219.000.
Deprez, Thomas A., to Gleason Works, The. Endless chain apparatus for forming spur and helical gears with means for controlling chain. 4,204,786, Cl. 409-262.000.
Deresh, Ilya A.: *See—*
Shikhirev, Boris N.; Matrosov, Evgeny A.; and Deresh, Ilya A., 4,204,370, Cl. 51-80.00A.
Desai, Kishor A., to American Color & Chemical Corporation. Azoanilino-toluene sulfonamidoalkyleneamine cationic disazo dyes for paper. 4,204,994, Cl. 260-174.000.
Desbois, Michel, to Rhone-Poulenc Industries. Process for the dimerization of C_8-C_{20} olefins and the olefin dimers obtained thereby. 4,205,195, Cl. 585-510.000.
DeSoto, Inc.: *See—*
Beauchamp, Gerson E., 4,204,971, Cl. 252-63.500.
Dexter Corporation, The: *See—*
Lind, Herbert C.; Rumore, Peter J.; and Wysocki, Tadeusz S., 4,204,532, Cl. 128-132.00D.
Dharia, Prabodh M.: *See—*
Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; and Kurtz, John J., 4,205,200, Cl. 370-83.000.
Dhein, Rolf: *See—*
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Diamond International Corporation: *See—*
Reeve, Randy F., 4,204,614, Cl. 222-153.000.
Dicon Systems Limited: *See—*
Turlej, Zbigniew W., 4,205,306, Cl. 340-629.000.
Diggs, Richard E. Apparatus for desalinating water. 4,204,914, Cl. 202-176.000.
Dille, Kenneth L.: *See—*
Biasotti, Joseph B.; Dorn, Peter; Herbstman, Sheldon; and Dille, Kenneth L., 4,204,841, Cl. 44-71.000.
Dim, Alexander: *See—*
Fraser, Donald B.; Dim, Alexander; Anthony, Kevin E.; Costello, Wayne R.; and Grazier, Phillip E., 4,204,922, Cl. 204-105.00R.
Dimeff, John. Device for recording and reproducing mandibular motion. 4,204,326, Cl. 433-50.000.
Dingle, Raymond; Gossard, Arthur C.; Petroff, Pierre M.; and Wiegmann, William, to Bell Telephone Laboratories, Incorporated. Periodic monolayer semiconductor structures grown by molecular beam epitaxy. 4,205,329, Cl. 357-16.000.
DiStefano, Thomas H.; and Kuhn, Lawrence, to International Business Machines Corporation. Apparatus for detecting information stored on photocopying media, transmitting and storing the same. 4,204,725, Cl. 355-3.00R.
Dobson, Derrick C.: *See—*
Atherton, John H.; Dobson, Derrick C.; Hodgkinson, Ian; and Clarke, John R. P., 4,204,838, Cl. 23-230.00R.
Dobson Park Industries, Limited: *See—*
Elliott, Anthony, 4,204,780, Cl. 400-261.000.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
Thubeauville, Heinz, 4,205,047, Cl. 422-242.000.
Documation Incorporated: *See—*
Music, John, 4,205,309, Cl. 340-739.000.
Dominick, Ellen K.; and Scherer, George W., to Corning Glass Works. Carbon coating for a starting member used in producing optical waveguide. 4,204,850, Cl. 65-3.00A.
Dominion Auto Accessories Limited: *See—*
Bleiweiss, Arthur F.; Cotoara, Dumitru; and Willkes, Robert J., 4,205,366, Cl. 362-35.000.
Donaldson Company, Inc.: *See—*
Brenholt, David L., 4,204,846, Cl. 55-272.000.
Johnston, Gordon L., 4,204,849, Cl. 55-310.000.
Donnally, William, Jr., to United States of America, Army. Signal delay system. 4,205,283, Cl. 333-165.000.
Dorn, Peter: *See—*
Biasotti, Joseph B.; Dorn, Peter; Herbstman, Sheldon; and Dille, Kenneth L., 4,204,841, Cl. 44-71.000.
Doucin, Guy; and Marchal, Paul, to Air Industrie. Installation for treating a product in a gaseous medium. 4,204,340, Cl. 34-225.000.
Douglas, Robert R., to Western Electric Company, Inc. Laser welding system and method. 4,205,216, Cl. 219-121.00L.
Dow Chemical Company, The: *See—*
McIntyre, James A.; Phillips, Robert F.; and Lefever, Joseph D., 4,204,918, Cl. 204-24.000.
Muench, Wayne C.; Hormel, Thad S.; Kirchhoff, Pamela M.; and Robbins, Lanny A., 4,205,188, Cl. 568-764.000.
Potts, Irvin W., Jr., 4,205,014, Cl. 260-650.00R.
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,205,016, Cl. 260-665.00R.
Wang, Chun S.; McGregor, Stanley D.; and Nestrick, Terry J., 4,205,015, Cl. 260-651.00R.
Wilson, David A.; and McCrary, Avis L., 4,205,065, Cl. 424-81.000.
Dow Chemical Company Limited: *See—*
Clifford, David P., 4,204,996, Cl. 260-326.00E.
Dreamland Electrical Appliances Limited: *See—*
Cole, Graham M., 4,205,223, Cl. 219-501.000.
Dresser Industries, Inc.: *See—*
Lichtenberg, Heinz D., 4,205,266, Cl. 324-253.000.
Drucker, Melvin H., to Westinghouse Electric Corp. Power line carrier apparatus. 4,205,360, Cl. 361-68.000.
Ducreuzet, Jean, to Creusot-Loire. High-capacity crane with counterweight device. 4,204,603, Cl. 212-49.000.
Duh, Ben, to Goodyear Tire & Rubber Company, The. Method for production of high molecular weight polyester with low catalyst level and low carboxyl content. 4,205,157, Cl. 528-272.000.
Dunchock, Richard S., to Optarac Corporation. Eyeglass case display unit. 4,204,602, Cl. 211-13.000.
Dunn, Burton D., to Lava Gardens, Inc. Educational kit for solidification of a chemical compound to produce crystal growth. 4,204,599, Cl. 206-575.000.
Dunnigan, Daniel A.: *See—*
Tadanier, John S.; Dunnigan, Daniel A.; Freiberg, Leslie A.; and Martin, Jerry R., 4,205,070, Cl. 424-180.000.
Du Pont de Nemours, E. I., and Company: *See—*
Carlson, Dana P., 4,204,927, Cl. 204-159.180.
Hoeschele, Guenther K., 4,205,158, Cl. 528-300.000.
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., to Smith Kline & French Laboratories Limited. Pharmaceutical compositions having immunosuppressant activity and methods therefor. 4,205,071, Cl. 424-244.000.
Durham, Harry G.; and Carr, John B., to Shell Oil Company. Lipogeneis inhibition by certain esters of substituted benzodioxincarboxylic acids. 4,205,076, Cl. 424-270.000.
Durham, Harry G.; and Carr, John B., to Shell Oil Company. Benzodioxincarboxamides. 4,205,079, Cl. 424-275.000.
Durling, Harold, to Midland-Ross Corporation. Exhaust valve assembly. 4,204,555, Cl. 137-102.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Gauchel, Peter; and Wissinger, Waldemar, 4,204,821, Cl. 425-131.100.
Jaschke, Hans; Kautz, Rudolf; Plate, Hermann; and Ulb, Horst, 4,205,107, Cl. 428-58.000.
Dynapol: *See—*
Dale, James A.; and Ng, Steve Y. W., 4,205,151, Cl. 526-262.000.
E. Cacarda GmbH: *See—*
Rothe, Eva, 4,204,523, Cl. 126-450.000.
E.G.O. Elektro-Geraete Blanc und Fischer: *See—*
Goessler, Gerhard, 4,205,292, Cl. 337-101.000.
E. R. Squibb & Sons, Inc.: *See—*
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,204,540, Cl. 128-283.000.
Sykes, Richard B.; Wells, J. Scott; Principe, Pacifico A.; and Liu, Wen C., 4,205,068, Cl. 424-117.000.
Earnest, Ernest R., to Hydragon Corporation, The. Turbine engine with exhaust gas recirculation. 4,204,401, Cl. 60-39.030.
Eastman Kodak Company: *See—*
Blazey, Richard N., 4,205,321, Cl. 346-153.000.
Chapman, Derek D.; and Wu, E-ming, 4,204,870, Cl. 430-213.000.
Chapman, Derek D., 4,204,993, Cl. 260-156.000.
Horak, Jerry R.; Langworthy, Harold F.; Rauner, Frederick J.; and Gross, Robert C., 4,204,866, Cl. 430-306.000.
Howe, Dennis G., 4,205,339, Cl. 179-100.10G.
Modney, William; and Rosenburgh, Norman J., 4,204,733, Cl. 355-64.000.
O'Brien, Robert J., 4,205,220, Cl. 219-216.000.
Wu, Tai-Wing; and Sullivan, Sheryl S., 4,204,839, Cl. 23-230.00B.
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Ebigt, Joachim: *See—*
Hermann, Hans D.; Ebigt, Joachim; and Hutten, Ulrich M., 4,205,146, Cl. 525-61.000.
Eckendorff, Jean-Pierre. Tools for reconditioning a valve seat in a tap. 4,204,784, Cl. 408-83.500.
Economopoulos, Marios, to Centre de Recherches Metallurgiques Centrum voor Research in de Metallurgie. Heat-treating tubular steel sections. 4,204,892, Cl. 148-145.000.
Edmaier, Franz: *See—*
Schulmeister, Robert; Edmaier, Franz; and Kiefer, Gunther, 4,204,848, Cl. 55-269.000.
Edwin Cooper, Inc.: *See—*
Papay, Andrew G.; and O'Brien, Joseph P., 4,204,969, Cl. 252-45.000.
Eerkens, Jozef W. Neutrino communication arrangement. 4,205,268, Cl. 455-620.000.
Efimenko, Sergei P.: *See—*
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.
Ehehalt, Theobald: *See—*
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Eichholz, Gunter: *See—*
Kreuzburg, Eberhard; Eichholz, Gunter; and Dederichs, Knut, 4,204,959, Cl. 210-195.100.
Eidam, Lane L. P. Locking mechanism for machine tool holder-/adapter. 4,204,303, Cl. 29-26.00A.
Eidam, Lane L. P. Travel limit stop pin. 4,204,304, Cl. 29-26.00A.
Eidam, Manfred: *See—*
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.
Eino, Tomomi: *See—*
Harada, Susumu; Kondo, Toshio; and Eino, Tomomi, 4,204,483, Cl. 123-32.0EL.

Eishima, Tetsusuke; Ikariyama, Takehiro; Jinnouchi, Raizo; Oyagi, Kunioki; and Soda, Takashi, to Iwatsu Electric Co. Ltd.; and Nippon Telegraph and Telephone Public Corporation. Carbon granule microphone with molded resin-conductive carbon electrode. 4,205,206, Cl. 179-124.000.

Eisinger, Frantisek L., to Foster Wheeler Energy Corporation. Helical spacer for heat exchanger tube bundle. 4,204,570, Cl. 165-69.000.

Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, to Veb Kombinat Fortschritt Landmaschinen Neustadt In Sachsen. Gear drive for multiple row harvester. 4,204,387, Cl. 56-98.000.

Electric Power Research Institute, Inc.: *See*—
Stubblefield, Thomas W., 4,205,289, Cl. 336-57.000.

Electro Materials Corp. of America: *See*—
Johnson, Gary W.; and Hilson, David G., 4,205,297, Cl. 338-195.000.

Eli Lilly and Company: *See*—
Kirst, Herbert A., 4,205,164, Cl. 542-421.000.

Elliott, Anthony, to Dobson Park Industries, Limited. Typewriter with improved case shift means. 4,204,780, Cl. 400-261.000.

Ellis, Belvin B.: *See*—
Lin, Kou C.; Ellis, Belvin B.; and Burkhardt, Charles E., 4,205,288, Cl. 336-5.000.

Elsasser, Heinrich: *See*—
Vinnemann, Antonius; Elsasser, Heinrich; Walter, Manfred; and Gaiser, Willi, 4,204,414, Cl. 66-145.00R.

Elton, Michael J.; Jackson, Arthur; and Harrison, John W., to Sterling Drug Inc. Process for preparing racemic 4-hydroxyphenylglycine. 4,205,185, Cl. 562-444.000.

Emblem, Harold G.: *See*—
Walters, Ian R.; and Emblem, Harold G., 4,205,032, Cl. 264-63.000.

Emerson Electric Co.: *See*—
Hildebrandt, Eugene F.; and Fellner, Herbert G., 4,205,245, Cl. 310-68.00E.

Emmert, Hermann: *See*—
Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, 4,204,974, Cl. 252-301.10W.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Klose, Peter H.; and Messing, Wayne P., 4,205,387, Cl. 364-900.000.

Energy Transportation Group, Incorporated: *See*—
Tornay, Edmund G., 4,204,813, Cl. 417-435.000.

Englmaier, Gert: *See*—
Kirbis, Manfred; Schilde, Peter; and Englmaier, Gert, 4,204,318, Cl. 29-734.000.

Erche, Manfred; Filberich, Ludwig; Pove, Dusan; Waldmann, Hermann; and Weibelzahl, Manfred, to Siemens Aktiengesellschaft. Method for the transmission of DC current between at least one rectifier station and several inverter stations. 4,205,368, Cl. 363-35.000.

Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., to Keuffel & Esser Company. Electronic surveying system. 4,205,385, Cl. 364-560.000.

Eriksen, Harald S., to Lear Siegler, Inc. Relief valve for fluid systems. 4,204,560, Cl. 137-508.000.

Eriksson, Bengt S.: *See*—
Petersson, Stig A.; and Eriksson, Bengt S., 4,204,861, Cl. 75-73.000.

Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. Ball bearing with radial apertures in end rings. 4,204,717, Cl. 308-6.00C.

Ernsthausen, Roger E.: *See*— ,
Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., 4,205,392, Cl. 365-116.000.

Erskine Manufacturing Company, Inc.: *See*—
Gustafson, Wayne, 4,204,699, Cl. 280-415.00R.

Esaki, Leo; Sai-Halasz, George A.; and Chang, Leroy L., to United States of America, Army. Infrared optical devices of layered structure. 4,205,331, Cl. 357-30.000.

Esch, Victor H.; and Fristrom, Robert M. Hazardous atmosphere badge. 4,205,043, Cl. 422-56.000.

Espana, Salvador, to Smith International, Inc. Friction bearing rock bit and segment, and method for making them. 4,204,437, Cl. 76-108.00A.

Etablissement Public: Institut National de la Recherche Agronomique: *See*—
Maubois, Jean-Louis J.; Mocquot, Germain P. C. B.; and Vassal, Louis J., 4,205,090, Cl. 426-40.000.

Etaix, Jean-Francois, to U.S. Philips Corporation. Connector for coupling optical fibers to an emitter or receiver of luminous energy. 4,204,743, Cl. 350-96.200.

Ethyl Corporation: *See*—
Malec, Robert E., 4,204,481, Cl. 123-1.00A.

Euteco S.p.A.: *See*—
Invernizzi, Renzo; Ligorati, Ferdinando; and Fontanesi, Maurizio, 4,204,981, Cl. 252-429.00B.

Everbrite Electric Signs, Inc.: *See*—
Trame, Charles E., 4,205,036, Cl. 264-132.000.

Evteev, Dmitry P.: *See*—
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.

Excel Industries Inc.: *See*—
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,204,576, Cl. 172-22.000.

Exxon Production Research Company: *See*—
Holland, Warren E.; Burley, James D.; and Arendt, Henry P., 4,204,690, Cl. 277-27.000.

Exxon Research & Engineering Co.: *See*—
Metrailer, William J.; Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,204,943, Cl. 208-50.000.
Mitchell, Howard L., III; and Waghorne, Robert H., 4,205,194, Cl. 585-407.000.
Neavel, Richard C., 4,204,843, Cl. 48-210.000.

Faber, Edward S.; Hovan, John J.; and Sinsheimer, Walter J., to Western Electric Company, Inc. Substrate straightening adaptor for electrical connector assembly. 4,204,737, Cl. 339-65.000.

Fabrique Nationale Herstal, en abrege FN, Societe Anonyme: *See*—
Vincent, Rene J., 4,204,965, Cl. 210-447.000.

Fadeev, Alexandr I.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V., 4,204,910, Cl. 176-30.000.

Fahey, Judith B., to Minnesota Mining and Manufacturing Company. Anthraquino-cycloalkane dyes. 4,205,005, Cl. 430-72.000.

Fahnler, Friedrich: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, 4,205,159, Cl. 528-338.000.

Falcon Safety Products, Inc.: *See*—
Grossman, Morris G.; Levy, Edward D.; and Meisner, Edward H., 4,204,335, Cl. 33-476.000.

Farber: *See*—
Bauer, Walter; Krobel; and Farber, 4,204,724, Cl. 354-281.000.

Faupel, Werner: *See*—
Ritter, Ernst; Schwartz, Reinhard; Muuller, Rolf; Sturm, Waldemar; and Faupel, Werner, 4,204,510, Cl. 123-179.00L.

Fay, Edward W.: *See*—
Williams, George C.; and Fay, Edward W., 4,205,323, Cl. 346-165.000.

Feather, Harvey E., to Honeywell Information Systems Inc. Data base conversion system. 4,205,371, Cl. 364-200.000.

Fehler, Adolf; Kirschey, Gunter; Kappler, Gunter; and Kirchdorffer, Gerhard, to Motoren- und Turbinen-Union Munchen GmbH. Combustion chamber for gas turbine engines, particularly an ignition device for such a combustion chamber. 4,204,404, Cl. 60-740.000.

Fein, Michael E.: *See*—
Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., 4,205,392, Cl. 365-116.000.

Feingers, Judith: *See*—
Wagner, Daniel B.; Pick, Anthony J.; and Feingers, Judith, 4,205,058, Cl. 424-1.000.

Feldstein, Cyril; Lewis, Gilbert W.; and Culler, Virgil H., to California Institute of Technology. Simultaneous muscle force and displacement transducer. 4,204,544, Cl. 128-642.000.

Fellner, Herbert G.: *See*—
Hildebrandt, Eugene F.; and Fellner, Herbert G., 4,205,245, Cl. 310-68.00E.

Feltz, Edward J.; and Cunningham, Ross, to Cunningham, John. Treatment composition for use in chrome removal and recovery. 4,204,973, Cl. 252-181.000.

Fengels, Gerd: *See*—
Rothaemel, Gunther; and Fengels, Gerd, 4,204,710, Cl. 294-77.000.

Ferraro, Michael V.: *See*—
Del Prete, Cosimo; and Ferraro, Michael V., 4,204,440, Cl. 81-111.000.

Ferrini, Pier G., to Ciba-Geigy Corporation. Substituted coumarin compounds. 4,205,082, Cl. 424-281.000.

Ferro Corporation: *See*—
Brueggemann, Walter H.; and Brenner, John A., 4,205,028, Cl. 264-24.000.

Feuillade, Jean-Louis J., to Societe B.M. Costamagna. Process of railroad tie concrete casting. 4,204,660, Cl. 249-86.000.

Field, Thomas A.: *See*—
Serlin, Richard A.; and Field, Thomas A., 4,205,211, Cl. 219-76.130.

Figura, Gene B. Back-packing stove for a Sierra-type cup. 4,204,516, Cl. 126-9.00R.

Filberich, Ludwig: *See*—
Erche, Manfred; Filberich, Ludwig; Pove, Dusan; Waldmann, Hermann; and Weibelzahl, Manfred, 4,205,368, Cl. 363-35.000.

Fildan, Gerhard. Fastener for garments. 4,204,300, Cl. 24-201.0HE.

Filippini, Alfredo: *See*—
Filippini, Gennaro; and Filippini, Alfredo, 4,204,683, Cl. 273-371.000.

Filippini, Gennaro; and Filippini, Alfredo. Device and method for detection of the shots on a target from a distance. 4,204,683, Cl. 273-371.000.

Filter Specialists, Inc.: *See*—
Morgan, Howard W., Jr., 4,204,966, Cl. 210-455.000.

Finishing Equipment, Inc.: *See*—
Sabatka, Winston E., 4,204,913, Cl. 202-168.000.

Finney, Roy P., to Medical Engineering Corp. Sleeve implant. 4,204,530, Cl. 128-79.000.

Firmenich S.A.: *See*—
Vite, Jean P.; Francke, Ernst J. W.; and Ohloff, Gunther, 4,205,084, Cl. 424-285.000.

Fischer, Jerome A., to Lucas-Milhaupt, Inc. Container and soldering kit. 4,204,597, Cl. 206-216.000.

Fischer, Johanna: *See*—
Schatz, Franz; Stammbach, Christian; Thiele, Kurt; Wagner-Jauregg, Theodor W.; Zirngibl, Ludwig; Fischer, Johanna; and Jahn, Ulrich, 4,204,998, Cl. 260-326.150.

Fisher, Charles B.; and Fisher, Sidney T. Quantized modulation systems. 4,205,241, Cl. 307-361.000.

Fisher, Clyde. Reflective signalling device. 4,204,746, Cl. 350-99.000.

Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,205,241, Cl. 307-361.000.

Fisli, Tibor, to Xerox Corporation. System for providing electrolessly nickel coated polished high speed multi-faceted polygonal scanners. 4,205,100, Cl. 427-162.000.

Fitch, Robert H.: *See*—
Kurtz, Bruce E.; and Fitch, Robert H., 4,204,920, Cl. 204-98.000.

Flanders, Robert L.; and Blanton, William A., Jr., to Chevron Research Company. Process for removing pollutants from nonzeolitic catalyst regenerator flue gas. 4,204,944, Cl. 208-120.000.

Flanders, Robert L.; and Blanton, William A., Jr., to Chevron Research Company. Removing pollutants from flue gas in nonzeolitic catalytic cracking. 4,204,945, Cl. 208-120.000.

Flatow, Robert E. Water purification system. 4,204,956, Cl. 210-87.000.

Fleenor, Richard P., to Manning Environmental Corp. Fluid level measurement apparatus for mounting in manholes and similar structures. 4,205,315, Cl. 343-14.000.

Flentge, Robert W., to A. F. Dormeyer Manufacturing Co., Inc. Heavy duty converter. 4,205,291, Cl. 336-92.000.

FMC Corporation: *See*—
Haley, Frank P.; and McTamaney, Louis S., 4,205,308, Cl. 340-686.000.

Foam Controls Inc.: *See*—
Schrader, Joseph F.; and Szeliga, Phillip C., 4,204,612, Cl. 222-40.000.

Focke, Heinz, to Focke & Pfuhl. Packets for cigarettes, cigarillos or the like. 4,204,630, Cl. 229-15.000.

Focke & Pfuhl: *See*—
Focke, Heinz, 4,204,630, Cl. 229-15.000.

Fogel, Isaac, to Classic Corporation. Waterbed mattress. 4,204,289, Cl. 5-451.000.

Fohl, Timothy, to GTE Sylvania Incorporated. Leadless electric flash lamp. 4,204,834, Cl. 431-362.000.

Fontanesi, Maurizio: *See*—
Invernizzi, Renzo; Ligorati, Ferdinando; and Fontanesi, Maurizio, 4,204,981, Cl. 252-429.00B.

Ford, Gregory A., to Phillips Petroleum Company. Continuous analysis of beverages. 4,204,962, Cl. 210-316.000.

Ford, James P., Jr. Method and apparatus for extracting teeth. 4,204,330, Cl. 433-148.000.

Ford Motor Company: *See*—
Carriere, Donald L., 4,204,412, Cl. 64-17.00R.
Haygood, Juan C.; and Harman, Ted L., 4,205,325, Cl. 340-147.0MD.
Mohla, Prem P., 4,204,666, Cl. 266-216.000.

Forestier, Jean; Leblanc, Bernard; Monteil, Marcel; and Monteil, Pierre, to Commissariat a l'Energie Atomique. Once-through forced-circulation steam generator. 4,204,502, Cl. 122-32.000.

Forrest, Esli J. Pre-stressed concrete construction. 4,205,029, Cl. 264-34.000.

Forrest, William J. Wind collecting method and apparatus. 4,204,795, Cl. 415-2.000.

Forster, George; and Von Wettstein, Herbert. Surgical plate for holding the hand and the fingers during hand and finger operations. 4,204,533, Cl. 128-133.000.

Forster, Jurgen: *See*—
Klesse, Fritz; and Forster, Jurgen, 4,204,935, Cl. 204-192.00F.
Klesse, Fritz; and Forster, Jurgen, 4,205,299, Cl. 338-308.000.

Fortune, William S. Replaceable tip for desoldering tools. 4,204,299, Cl. 15-415.00R.

Foster Wheeler Energy Corporation: *See*—
Eisinger, Frantisek L., 4,204,570, Cl. 165-69.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See*—
Masumoto, Hakaru; and Sawaya, Showhachi, 4,204,887, Cl. 148-31.000.
Masumoto, Hakaru; and Sawaya, Showhachi, 4,204,888, Cl. 148-31.000.

Fournier, Herve L. Baby's companion and security blanket. 4,204,362, Cl. 46-116.000.

Fourre, Jacques: *See*—
Maire, Jacques; Fourre, Jacques; and Gervais, Jean P., 4,205,055, Cl. 423-445.000.

Fowler, Ronald J., to United States of America, Navy. Arming-safing system for airborne weapons. 4,204,475, Cl. 102-262.000.

Fox, Marvin; Cooper, Donald L.; and Warren, Walter B., to TRW Inc., Systems & Energy. Position determining and dynamic positioning method and system for floating marine well drill platforms and the like. 4,205,379, Cl. 364-432.000.

Fr. Winkler KG: *See*—
Schnee, Walter, 4,204,466, Cl. 99-443.00C.

France, Jerry; and Morgan, James P. Flexible anti-skid material and method of making same. 4,205,109, Cl. 428-150.000.

Francke, Ernst J. W.: *See*—
Vite, Jean P.; Francke, Ernst J. W.; and Ohloff, Gunther, 4,205,084, Cl. 424-285.000.

Franklin, Robert C., to Beckman Instruments, Inc. Ultracentrifuge overspeed disk detection system. 4,205,261, Cl. 318-480.000.

Fraser, Donald B.; Dim, Alexander; Anthony, Kevin E.; Costello, Wayne R.; and Grazier, Phillip E., to Broken Hill Propietary Company Limited, The. Simultaneous electrodissolution and electrowinning of metals from simple sulphides. 4,204,922, Cl. 204-105.00R.

Frazel, Wilbur H., to General Signal Corporation. Wide range control for delivery apparatus. 4,204,809, Cl. 417-15.000.

Freas, Mark S.: *See*—
Jones, William M.; and Freas, Mark S., 4,204,830, Cl. 431-8.000.

Freeman, John L. Sail apparatus for a land vehicle. 4,204,694, Cl. 280-810.000.

Freiberg, Leslie A.: *See*—
Tadanier, John S.; Dunnigan, Daniel A.; Freiberg, Leslie A.; and Martin, Jerry R., 4,205,070, Cl. 424-180.000.

French, Joseph A.: *See*—
Pasha, Mohiuddin; O'Hara, David K.; and French, Joseph A., 4,204,980, Cl. 252-428.000.

Freudlsperger, August: *See*—
Seifert, Dieter; Regler, Dieter; Ofenmacher, Volker; Moritz, Alfred; Freudlsperger, August; and Berger, Walter, 4,204,515, Cl. 125-16.00R.

Frey, Sydney W., Jr., to Allen-Bradley Company. Rheostat trimmer. 4,205,296, Cl. 338-150.000.

Fridman, Vladimir M.: *See*—
Khutoretsky, Garri M.; Fridman, Vladimir M.; Zagorodnaya, Galina A.; Vorontsov, Alexandr I.; Ignatiev, Anatoly D.; and Sudarikov, Vasily L., 4,204,313, Cl. 29-596.000.

Friedrich, Jurgen: *See*—
Gothe, Diethard; Nuske, Jeffrey J.; and Friedrich, Jurgen, 4,204,427, Cl. 73-304.00C.

Fristrom, Robert M.: *See*—
Esch, Victor H.; and Fristrom, Robert M., 4,205,043, Cl. 422-56.000.

Fugere, Albert L. Training shoe for soccer. 4,204,346, Cl. 36-114.000.

Fuji Electric Co., Ltd.: *See*—
Omori, Tsuguharu; and Kawasaki, Michio, 4,205,197, Cl. 13-27.000.

Fuji Photo Film Co., Ltd.: *See*—
Asanuma, Katsumi; and Mogi, Shigeru, 4,204,754, Cl. 353-116.000.
Hamada, Shinji; Hoshino, Fumio; and Tabata, Junichi, 4,204,736, Cl. 355-118.000.

Fujii, Ryuichi: *See*—
Nagasawa, Kohtaro; Ogitani, Osamu; and Fujii, Ryuichi, 4,205,018, Cl. 525-404.000.

Fujii, Tadashi, to Ricoh Company, Ltd. Wet type direct image recording method. 4,205,320, Cl. 346-1.100.

Fujimatsu, Masaaki, to Japan Exlan Company Limited. Process for producing acrylic synthetic fibers having anti-pilling properties. 4,205,037, Cl. 264-182.000.

Fujimoto, Masanori: *See*—
Fukami, Kousuke; Fujimoto, Masanori; Fujita, Fumio; and Nagase, Tsuneyuki, 4,205,218, Cl. 219-145.230.

Fujimoto, Yasuo; and Yamabe, Shigeru, to Nippon Chemiphar Company, Limited. Propionic acid derivatives. 4,205,170, Cl. 546-80.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Hemmi, Keiji, 4,205,166, Cl. 544-27.000.

Fujita, Fumio: *See*—
Fukami, Kousuke; Fujimoto, Masanori; Fujita, Fumio; and Nagase, Tsuneyuki, 4,205,218, Cl. 219-145.230.

Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, to Mitsubishi Chemical Industries, Limited; and Seikagaku Kogyo Company, Ltd. Process for the renewal of an insolubilized glucose isomerase. 4,205,127, Cl. 435-179.000.

Fujitsu Limited: *See*—
Hisazawa, Masahide, 4,205,301, Cl. 371-3.000.

Fujiyoshi, Kenji: *See*—
Morita, Yoshinori; Inoue, Hiroshi; and Fujiyoshi, Kenji, 4,205,021, Cl. 525-240.000.

Fukami, Kousuke; Fujimoto, Masanori; Fujita, Fumio; and Nagase, Tsuneyuki, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Covered electrode for arc welding. 4,205,218, Cl. 219-145.230.

Fukumoto, Toshito: *See*—
Kurata, Kenzi; Fukumoto, Toshito; Yoshida, Yuji; Kusama, Masanori; and Tsuruta, Shintaro, 4,204,915, Cl. 203-2.000.

Fukushima, Yasuhiro, to Kabushiki Kaisha Daini Seikosha. Micro stepping motor. 4,205,244, Cl. 310-49.00R.

Fuller Company: *See*—
Porter, Edward S., 4,204,835, Cl. 432-58.000.

Fuller, Paul, to Vickers Limited. Document handling apparatus. 4,204,640, Cl. 235-476.000.

Fultz, Jack V.: *See*—
Barton, Richard E.; Fultz, Jack V.; Narahara, Yoshiyasu; and Shebanow, Michael S., 4,205,357, Cl. 360-135.000.

Fumeaux, Jean-Paul: *See*—
Aufderhaar, Ernst; Gallay, Jean J.; Kuhne, Manfred; Meyer, Alfred; Rechsteiner, Oswald; Schellenbaum, Max; and Fumeaux, Jean-Paul, 4,205,077, Cl. 424-273.00B.

Furnas, Robert L., to Milsco Manufacturing Company. Foam mold clamp assembly. 4,204,825, Cl. 425-451.900.

Furuichi, Katsushi: *See—*
Goshima, Yoshitomo; Kawakubo, Kazuo; Furuichi, Katsushi; Sakamaki, Hisashi; Sawamura, Osamu; Komiya, Yutaka; and Tomosada, Masahiro, 4,204,728, Cl. 355-4.000.

G. D. Searle & Co.: *See—*
Hallinan, E. Ann; and Mazur, Robert H., 4,204,991, Cl. 260-112.50R.
Wagner, Hans A., 4,205,169, Cl. 544-323.000.

Gagen, Igor E.: *See—*
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

Gaiser, Willi: *See—*
Vinnemann, Antonius; Elsasser, Heinrich; Walter, Manfred; and Gaiser, Willi, 4,204,414, Cl. 66-145.00R.

Galileo Electro-Optics Corp.: *See—*
Tosswill, Christopher H., 4,205,228, Cl. 250-336.000.

Gallay, Jean J.: *See—*
Aufderhaar, Ernst; Gallay, Jean J.; Kuhne, Manfred; Meyer, Alfred; Rechsteiner, Oswald; Schellenbaum, Max; and Fumeaux, Jean-Paul, 4,205,077, Cl. 424-273.00B.

Game, Jacques-Marie N.; and Tiesse, Bernard A., to Sogitec. Method and apparatus for synchronizing the reading of audible and visual information carried by different supports. 4,204,751, Cl. 352-17.000.

Games, John E.; Bitterli, William W.; and Healey, David M., to United Technologies Corporation. Energy conservative control of heating, ventilating, and air conditioning (HVAC) systems. 4,205,381, Cl. 364-505.000.

Gane, Brian R.; and Stewart, David G., to British Petroleum Company Limited, The. Process for the hydrocarbonylation of methanol to ethanol in the presence of added oxygen-containing organic compounds. 4,205,190, Cl. 568-902.000.

Ganellin, Charon R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,205,071, Cl. 424-244.000.

Garrett Corporation, The: *See—*
Bosco, Armand, 4,204,718, Cl. 308-15.000.
Carter, William L.; Greathouse, Jack F.; and Zeilinger, Philip T., 4,204,811, Cl. 417-288.000.

Gasparaitis, Bernard; and Albright, Charles D., to Motorola, Inc. Flexible dipole antenna for hand-held two-way radio. 4,205,319, Cl. 343-792.000.

Gast Manufacturing Corporation: *See—*
Le Blanc, Joseph A., 4,204,815, Cl. 418-13.000.

Gastinne, Arnaud: *See—*
Cailliot, Serge, 4,204,964, Cl. 210-370.000.

Gates Rubber Company, The: *See—*
Newberry, Mark A., 4,205,034, Cl. 264-103.000.

Gateway Industries, Inc.: *See—*
Cislak, Raymond S.; and Romanzi, Louis, Jr., 4,204,652, Cl. 242-107.40R.

Gatto, Donald F., to Motorola, Inc. Access panel with non-destructive release. 4,204,608, Cl. 220-335.000.

Gauchel, Peter; and Wissinger, Waldemar, to Dynamit Nobel Aktiengesellschaft. Process and apparatus for the extrusion of coated skein-shaped profiles, preferably of thermoplastic synthetic resins. 4,204,821, Cl. 425-131.100.

Gaylord, Norman G.: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,205,096, Cl. 427-4.000.

Gebeke, Charles D., to Minnesota Mining and Manufacturing Company. Tape guide assemblies for video cassettes. 4,204,654, Cl. 242-199.000.

GEC-General Signal Limited: *See—*
Porter, Cyril A.; and Wardle, Malcolm R., 4,205,326, Cl. 340-147.00R.

Gehrmann, Heinz: *See—*
Merz, Georg; and Gehrmann, Heinz, 4,205,384, Cl. 364-555.000.

Gem Industries Inc.: *See—*
Stiles, Nathan; and Heininger, Richard T., 4,204,286, Cl. 5-11.000.

General Binding Corporation: *See—*
Staats, Henry N., 4,204,704, Cl. 281-21.00R.

General Dynamics Corporation Pomona Division: *See—*
Speer, Spencer J., 4,204,775, Cl. 366-336.000.

General Electric Company: *See—*
Boyle, Malachy V.; and Ouyang, Mid, 4,205,198, Cl. 174-171.000.
Brammerlo, Allen A., 4,205,247, Cl. 310-256.000.
Canney, Robert S.; Ouellette, Ronald J.; and Morong, William H., Jr., 4,205,290, Cl. 336-90.000.
Davis, William D., 4,205,249, Cl. 313-30.000.
Heartz, Robert A., 4,205,389, Cl. 364-900.000.
Houston, Douglas E.; and Loughran, James A., 4,204,628, Cl. 228-106.000.
Leger, Donald R.; Clifford, Peter P.; and Matson, William N., 4,204,803, Cl. 415-219.00R.
McVoy, Charles F., Jr., 4,204,417, Cl. 72-206.000.
Moore, Stanley E., 4,205,304, Cl. 340-365.00P.
Olander, Walter K., 4,205,007, Cl. 260-429.00C.
Thompson, Paige W., 4,204,378, Cl. 53-403.000.
Washington, Forest L., 4,205,358, Cl. 361-44.000.
Webb, Jimmy L.; and Ligon, Woodfin V., 4,204,428, Cl. 73-339.00R.

General Mills, Inc.: *See—*
Blake, Jon R., 4,205,093, Cl. 426-333.000.

General Signal Corporation: *See—*
Frazel, Wilbur H., 4,204,809, Cl. 417-15.000.

General Tire & Rubber Company, The: *See—*
Alexander, Joseph H., 4,204,903, Cl. 156-394.000.
Neubert, Terry C., 4,204,982, Cl. 260-5.000.
Neubert, Terry C., 4,204,984, Cl. 260-17.500.

George, Victor E.; Haas, Roger A.; Krupke, William F.; and Schlitt, Leland G., to United States of America, Energy. Multiple excitation regenerative amplifier inertial confinement system. 4,205,278, Cl. 331-94.50P.

Georgelis, Eric: *See—*
Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., 4,204,948, Cl. 209-223.00R.

Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,204,448, Cl. 83-177.000.

Gerlach, Robert, to Perkin-Elmer Corporation, The. Auger electron spectroscopy. 4,205,226, Cl. 250-305.000.

Gerner, Walter L.: *See—*
Maul, Stephen B.; Lemke, Paul A.; Gerner, Walter L.; and Yoder, John B., 4,204,364, Cl. 47-1.100.

Gervais, Jean P.: *See—*
Maire, Jacques; Fourre, Jacques; and Gervais, Jean P., 4,205,055, Cl. 423-445.000.

Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH: *See—*
Maixner, Uwe; and Milferstadt, Dieter, 4,205,232, Cl. 250-397.000.
Michaelis, Walfried; and Weitkamp, Claus, 4,204,908, Cl. 176-19.0LD.

Gesellschaft zur Errichtung von Unweltschutzanlagen mbH: *See—*
Kreuzburg, Eberhard; Eichholz, Gunter; and Dederichs, Knut, 4,204,959, Cl. 210-195.100.

Gibson, Kirk R.: *See—*
Jacobson, Robert L.; and Gibson, Kirk R., 4,204,947, Cl. 208-243.000.

Giglberger, Dieter: *See—*
Kohler, Robert; Muller, Jorn; Giglberger, Dieter; and Bestenreiner, Freidrich, 4,204,731, Cl. 355-16.000.

Gilchrist, Forbes D.; Miller, Robert L.; and Myers, Richard W., to Zenith Radio Corporation. Surface wave device with suppressed boundary-reflected waves. 4,205,280, Cl. 333-151.000.

Gipprich, John W., to Westinghouse Electric Corp. Phase shifting circuit element. 4,205,282, Cl. 333-161.000.

Giuggio, Nicholas; Noyes, Richard C.; and Zaman, Shakir U., to Combustion Engineering, Inc. Temperature sensitive self-actuated scram mechanism. 4,204,909, Cl. 176-22.000.

Giurtino, Joel F.: *See—*
Lobdell, Donn D.; Herman, Stephen J.; and Giurtino, Joel F., 4,205,042, Cl. 422-47.000.

Givens, Edmond W. Back exerciser. 4,204,676, Cl. 272-136.000.

Glace, William R.: *See—*
Ibsen, Robert L.; Glace, William R.; and Reed, William R., Jr., 4,204,978, Cl. 252-408.000.

Glaxo Group Limited: *See—*
Stables, Harry C.; and Briggs, Kenneth, 4,205,165, Cl. 544-20.000.

Glazer, Emmett J.: *See—*
Cich, Frank A.; Glazer, Emmett J.; and Smith, Edwin S., 4,205,149, Cl. 526-89.000.

Gleason Works, The: *See—*
Deprez, Thomas A., 4,204,786, Cl. 409-262.000.

Glenn, Travis A. Tack strip nailer. 4,204,625, Cl. 227-76.000.

Gloth, Richard E.; and Tazuma, James J., to Goodyear Tire & Rubber Company, The. Indane containing polymers. 4,205,160, Cl. 528-425.000.

Godo, Einar. Word recognizing system. 4,205,302, Cl. 340-146.200.

Goel, Prabhakar, to International Business Machines Corporation. Logic chip test system with path oriented decision making test pattern generator. 4,204,633, Cl. 371-27.000.

Goessler, Gerhard, to E.G.O. Elektro-Geraete Blanc und Fischer. Electric time switch. 4,205,292, Cl. 337-101.000.

Goethlich, Lutz: *See—*
Barzynski, Helmut; Hartmann, Heinrich; Lautenbach, Dieter; Osterloh, Rolf; Goethlich, Lutz; and Heil, Guenter, 4,205,139, Cl. 525-38.000.

Gogel, Edward V.: *See—*
Mattick, Leonard R.; and Gogel, Edward V., 4,205,092, Cl. 426-271.000.

Gold, Charles. High impedance electrical testing instrument for AC and DC voltage detection and continuity testing. 4,205,264, Cl. 324-51.000.

Goldin, Vladimir A.: *See—*
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Goldinger, John A., to PPG Industries, Inc. Scoring device having a referencing carriage. 4,204,445, Cl. 83-880.000.

Gomi, Yoshifumi: *See—*
Miyazawa, Yoshinori; and Gomi, Yoshifumi, 4,204,778, Cl. 400-124.000.

Gonzalez, Manuel A.: *See—*
Smith, Ronald J.; and Gonzalez, Manuel A., 4,205,049, Cl. 423-167.000.

Good, Wayne W., to Harter Corporation. Frame construction for a divider wall. 4,204,375, Cl. 52-239.000.

Goodman, Richard M., to American Cyanamid Company. Mixtures of polycationic and polyanionic polymers for scale control. 4,205,143, Cl. 525-213.000.

Goodyear Tire & Rubber Company, The: *See—*
Bartell, Jeffrey M.; and D'Elia, Robert V., 4,204,897, Cl. 156-155.000.
Cich, Frank A.; Glazer, Emmett J.; and Smith, Edwin S., 4,205,149, Cl. 526-89.000.
Davis, Joseph P.; and Nagy, Julius S., 4,205,103, Cl. 427-373.000.
Duh, Ben, 4,205,157, Cl. 528-272.000.
Gloth, Richard E.; and Tazuma, James J., 4,205,160, Cl. 528-425.000.
Streets, Roger L.; Rabito, Thomas G.; and Von Kamp, John, 4,204,987, Cl. 260-29.20E.
Weinstein, Arthur H., 4,205,153, Cl. 526-292.000.

Goof, Sven K. L. Finger operated control system for hand-held appliances. 4,205,236, Cl. 307-118.000.

Gordon, William J. J.; and Poze, Anthony N. Animal track teaching. 4,204,705, Cl. 283-1.00R.

Gorgone, Robert L.: *See—*
Iannadrea, Gerald; Gorgone, Robert L.; and Kovach, Alan J., 4,204,765, Cl. 356-71.000.

Goshima, Yoshitomo; Kawakubo, Kazuo; Furuichi, Katsushi; Sakamaki, Hisashi; Sawamura, Osamu; Komiya, Yutaka; and Tomosada, Masahiro, to Canon Kabushiki Kaisha. Method and apparatus for color conversion. 4,204,728, Cl. 355-4.000.

Gossard, Arthur C.: *See—*
Dingle, Raymond; Gossard, Arthur C.; Petroff, Pierre M.; and Wiegmann, William, 4,205,329, Cl. 357-16.000.

Gotanda, Motohiro. Apparatus for controlling a power source for an electrical alarm or indicator. 4,205,328, Cl. 340-521.000.

Gothe, Diethard; Nuske, Jeffrey J.; and Friedrich, Jurgen, to VDO Adolf Schindling AG. Device for the capacitive level height measurement of liquids or solids. 4,204,427, Cl. 73-304.00C.

Goto, Kenji: *See—*
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.

Gould Inc.: *See—*
Clausing, Challiss I, 4,205,207, Cl. 200-50.0AA.
Jacobs, Philip C., Jr., 4,205,294, Cl. 337-234.000.

Graham, Edward F. Life and weight saving aircraft seat structure. 4,204,657, Cl. 244-122.00R.

Gramatica, Giorgio, to Tecnimont S.p.A. Reactor for catalyzed exothermic reactions. 4,205,044, Cl. 422-191.000.

Grammer, Don O.: *See—*
Palmer, Nigel I.; and Grammer, Don O., 4,205,123, Cl. 429-147.000.

Gratzmuller, Claude A. Hydraulic control system for electric circuit-breakers. 4,204,461, Cl. 91-454.000.

Graves, Joel S. Apparatus for chronologically dispensing tablets. 4,204,611, Cl. 221-5.000.

Gray, Alan M. Ticket and reading device. 4,204,637, Cl. 235-431.000.

Gray, Lewis L. Golf aid. 4,204,332, Cl. 33-174.00F.

Grazier, Phillip E.: *See—*
Fraser, Donald B.; Dim, Alexander; Anthony, Kevin E.; Costello, Wayne R.; and Grazier, Phillip E., 4,204,922, Cl. 204-105.00R.

Greany, John K.: *See—*
Korklan, Harris J.; and Greany, John K., 4,204,907, Cl. 162-135.000.

Greathouse, Jack F.: *See—*
Carter, William L.; Greathouse, Jack F.; and Zeilinger, Philip T., 4,204,811, Cl. 417-288.000.

Green, David T., to United States Surgical Corporation. Manually powered surgical stapling instrument. 4,204,623, Cl. 227-19.000.

Greenberg, Raymond I.: *See—*
Meyer, Harry C.; Tanton, George A.; Greenberg, Raymond I.; and Williams, Joe E., 4,204,926, Cl. 204-157.10H.

Greentex Incorporated: *See—*
Corron, Donald C.; and Tallent, Glen, Jr., 4,204,301, Cl. 28-248.000.

Gremmelmaier, Claude; and Riethmann, Jean, to Ciba-Geigy Corporation. Process for producing cyameluric chloride. 4,205,167, Cl. 544-209.000.

Grier, Nathaniel: *See—*
Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ting, 4,205,064, Cl. 424-78.000.

Grinblat, Mark P.: *See—*
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Gringlaz, Aron G.: *See—*
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

Grivet, Francis, to J. Bobst & Fils, S.A. Device for conveying sheets within a sheet processing machine. 4,204,672, Cl. 271-188.000.

Gross, Robert C.: *See—*
Horak, Jerry R.; Langworthy, Harold F.; Rauner, Frederick J.; and Gross, Robert C., 4,204,866, Cl. 430-306.000.

Gross, Ulrich, to U.S. Philips Corporation. Device for automatic tonal accompaniment in electronic musical instruments. 4,204,453, Cl. 84-1.240.

Gross, William H.: *See—*
Wright, John W.; and Gross, William H., 4,205,276, Cl. 330-294.000.

Grossman, Morris G.; Levy, Edward D.; and Meisner, Edward H., to Falcon Safety Products, Inc. Instrument for positioning pictures on a mounting board. 4,204,335, Cl. 33-476.000.

Gruner, Ronald H., to Data General Corporation. Central processing unit employing microprogrammable control for use in a data processing system. 4,205,372, Cl. 364-200.000.

GTE Automatic Electric Laboratories, Incorporated: *See—*
Blackburn, Tom L., 4,205,275, Cl. 330-279.000.

GTE Laboratories Incorporated: *See—*
Dempsey, Martin E.; and Lee, Ching W., 4,205,285, Cl. 333-194.000.

GTE Sylvania Incorporated: *See—*
Fohl, Timothy, 4,204,834, Cl. 431-362.000.

Gubaidulin, Vyacheslav F.: *See—*
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.

Gulf Oil Corporation: *See—*
Kirkpatrick, Joel L., 4,205,177, Cl. 548-265.000.

Gulick, Joseph F.; Miller, James S.; and Pue, Alan J., to United States of America, Navy. Broadband interferometer and direction finding missile guidance system. 4,204,655, Cl. 244-3.190.

Gunn, Christopher J.; and Barker, Joseph, to Whitfield Wylie Limited. Nailing machine for use in the manufacture of wooden pallets. 4,204,624, Cl. 227-45.000.

Gunning, William F., to Xerox Corporation. Reproduction scanning system having intermediate storage between input and output scanning stations. 4,205,350, Cl. 358-296.000.

Gustafson, Wayne, to Erskine Manufacturing Company, Inc. Hitch for draft implement. 4,204,699, Cl. 280-415.00R.

Guyonnet, Marcel A. R. Apparatus for packaging pasty material. 4,204,382, Cl. 53-563.000.

Haas, Roger A.: *See—*
George, Victor E.; Haas, Roger A.; Krupke, William F.; and Schlitt, Leland G., 4,205,278, Cl. 331-94.50P.

Haemonetics Corporation: *See—*
Latham, Allen, Jr., 4,204,537, Cl. 128-214.00R.

Hafener, Klaus: *See—*
Wiest, Hubert; Ludwig, Peter; Hafener, Klaus; and Lieb, Erwin, 4,205,161, Cl. 528-487.000.

Haggarty, Michael J. Baseball throwing practice target. 4,204,677, Cl. 273-26.00A.

Haine, Francis: *See—*
Bridoux, Edouard; Bruneel, Christian; Haine, Francis; and Thomin, Guy, 4,204,435, Cl. 73-626.000.

Haines, Joseph R., Sr., to Haines Towing Inc. Anti-jackknife apparatus. 4,204,700, Cl. 280-432.000.

Haines Towing Inc.: *See—*
Haines, Joseph R., Sr., 4,204,700, Cl. 280-432.000.

Haley, Frank P.; and McTamaney, Louis S., to FMC Corporation. Programmable alarm system for marine loading arms. 4,205,308, Cl. 340-686.000.

Hall, Harold E., to Stalwart Rubber Company, The. Connector assembly for anode ring of cathode ray tube. 4,204,741, Cl. 339-200.00P.

Hall, John B.: *See—*
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,205,186, Cl. 568-600.000.

Hall, John W.: *See—*
Loker, W. Aleck; Bortzfield, Jon L.; Chard, Steven D.; Hall, John W.; and Meredith, John T., 4,204,589, Cl. 192-27.000.

Hall Jr., Harleston J.; Sassin, Roger I.; and Yuhas, Drew J., to AMF Incorporated. Game ball racket wherein certain racket components are structurally integrated with the racket frame by the string with which the racket is strung. 4,204,681, Cl. 273-73.00C.

Hallinan, E. Ann; and Mazur, Robert H., to G. D. Searle & Co. Sarcosine[1] dehydroalanine[8] angiotensin II derivatives. 4,204,991, Cl. 260-112.50R.

Halverson, Robert J. Electrical terminal cleaning device. 4,204,294, Cl. 15-185.000.

Hamada, Shinji; Hoshino, Fumio; and Tabata, Junichi, to Fuji Photo Film Co., Ltd. Method and device for contact-printing. 4,204,736, Cl. 355-118.000.

Hamanaka, Kunio; and Sakurai, Yoshiki, to Tokyo Shibaura Denki Kabushiki Kaisha. Flexible disk drive apparatus. 4,205,355, Cl. 360-99.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,204,901, Cl. 156-384.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,204,902, Cl. 156-384.000.

Hampson, James W.: *See—*
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,205,006, Cl. 260-410.700.

Handa, Hiroyuki; and Handa, Tomoko. Compact vacuum cleaner. 4,204,298, Cl. 15-344.000.

Handa, Tomoko: *See*—
Handa, Hiroyuki; and Handa, Tomoko, 4,204,298, Cl. 15-344.000.

Haneda, Akio: *See*—
Minezaki, Hisao; Haneda, Akio; Masaki, Asanori; Hanzawa, Takeo; and Uchiike, Yukio, 4,204,648, Cl. 242-18.00A.

Hani, August; Horler, Hansulrich; and Ursprung, Hans, to BBC Brown Boveri & Company Limited. Silencer on the intake side of a compressor with assembly of axially spaced annular sound-damping elements. 4,204,586, Cl. 181-229.000.

Hanna, James L., to Mead Corporation, The. Shelving system. 4,204,480, Cl. 108-108.000.

Hansen, George E.: *See*—
Cisco, Thomas F.; Hansen, George E.; and Agate, Robert N., 4,204,916, Cl. 203-6.000.

Hanzawa, Takeo: *See*—
Minezaki, Hisao; Haneda, Akio; Masaki, Asanori; Hanzawa, Takeo; and Uchiike, Yukio, 4,204,648, Cl. 242-18.00A.

Harada, Susumu; Kondo, Toshio; and Eino, Tomomi, to Nippondenso Co., Ltd. Fuel cut-off apparatus for electronically-controlled fuel injection systems. 4,204,483, Cl. 123-32.0EL.

Harada, Tetsuya, to Japan Synthetic Rubber Company, Limited. Process of producing 5-alkylidenenorbornene. 4,205,192, Cl. 585-363.000.

Harada, Toshiro; Kubo, Tadayuki; Kasuya, Kazusato; and Watanabe, Yukihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Comparator circuit adapted for use in a system for controlling the air-fuel ratio of an internal combustion engine. 4,204,482, Cl. 123-32.0EE.

Harada, Yoshiaki, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for controlling toner concentration of a liquid developer. 4,204,766, Cl. 356-404.000.

Harlfinger, Rudolf; Ehehalt, Theobald; and Kappes, Alfred, to Audi NSU Auto Union Aktiengesellschaft. Method of manufacturing rubbing surfaces of cast iron. 4,204,924, Cl. 204-129.350.

Harman, Ted L.: *See*—
Haygood, Juan C.; and Harman, Ted L., 4,205,325, Cl. 340-147.0MD.

Harrington, Richard H. Flying disc. 4,204,357, Cl. 46-74.00D.

Harrington, William O. Playing aid for keyboard instruments. 4,204,455, Cl. 84-468.000.

Harris, Samuel W.: *See*—
Lee, Richard J.; and Harris, Samuel W., 4,204,970, Cl. 252-51.50A.

Harrison, John W.: *See*—
Elton, Michael J.; Jackson, Arthur; and Harrison, John W., 4,205,185, Cl. 562-444.000.

Harrison, Paul H., to M & R Seal Press Co., Inc. Embossing press. 4,204,468, Cl. 101-3.0SP.

Hart, John R.; Lare, Donald W.; and Nault, James J., to Champion International Corporation. Synthetic polymeric fibrids, fibrid products and process for their production. 4,205,025, Cl. 264-14.000.

Harter Corporation: *See*—
Good, Wayne W., 4,204,375, Cl. 52-239.000.

Hartmann, Heinrich: *See*—
Barzynski, Helmut; Hartmann, Heinrich; Lautenbach, Dieter; Osterloh, Rolf; Goethlich, Lutz; and Heil, Guenter, 4,205,139, Cl. 525-38.000.

Hartsough, Larry D., to Perkin-Elmer Corporation, The. Method and apparatus for attaching a target to the cathode of a sputtering system. 4,204,936, Cl. 204-192.00R.

Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See*—
Schulte, Fritz; and Hurter, Wilfried, 4,204,912, Cl. 201-29.000.

Hasegawa, Yoshio: *See*—
Morohoshi, Fumio; and Hasegawa, Yoshio, 4,204,400, Cl. 84-484.000.

Haseler, Helmut: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, 4,204,867, Cl. 430-376.000.

Hashimoto, Teiji: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Hashimoto, Teiji, 4,204,762, Cl. 354-242.000.
Shimizu, Masami; and Hashimoto, Teiji, 4,205,287, Cl. 335-271.000.

Hashimoto, Tsutomu: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,205,134, Cl. 521-53.000.

Haskell, Donald M.: *See*—
Makovec, Donald J.; and Haskell, Donald M., 4,205,196, Cl. 585-701.000.

Hattori, Yoshinori; and Miyachi, Tamotu, to NGK Spark Plug Co., Ltd. Process for producing compact silicon nitride ceramics. 4,205,033, Cl. 264-65.000.

Haubold, Axel D.: *See*—
Bokros, Jack C.; Shim, Hong S.; and Haubold, Axel D., 4,204,542, Cl. 128-335.500.

Hauck, Warren J.: *See*—
Lane, Manning; Hauck, Warren J.; and Sweeney, Roy O., 4,204,287, Cl. 5-18.00R.

Hausler, Elwood B.: *See*—
Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., 4,205,363, Cl. 361-264.000.

Hausslein, Robert W.: *See*—
Byers, Charles H.; Hausslein, Robert W.; and Nestle, Mara O., 4,204,869, Cl. 430-564.000.

Haverland, Joseph G. Reel assembly. 4,204,651, Cl. 242-96.000.

Hawkins, Graham S. W., to Business Efficiency Aids, Inc. Rotary card index system. 4,204,351, Cl. 40-372.000.

Hayashi, Hideo: *See*—
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, 4,205,145, Cl. 525-502.000.

Hayashi, Toshimasa: *See*—
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.

Hayashibara Biochemical Laboratories, Inc.: *See*—
Fukami, Kousuke; Fujimoto, Masanori; Fujita, Fumio; and Nagase, Tsuneyuki, 4,205,218, Cl. 219-145.230.

Hayashimoto, Youichi, to Shindaiwa Kogyo Co., Ltd. Sprocket shaft stay. 4,204,320, Cl. 30-386.000.

Hayati, Hossein; Towers, Russell S.; and Carpenter, Peter G., deceased, to Stauffer Chemical Company. Preparation of high temperature shell molds. 4,204,872, Cl. 106-38.350.

Hayes, Fay A.; and Hayes, Leonard L. Inplace gasket belling machine. 4,204,823, Cl. 425-393.000.

Hayes, Leonard L.: *See*—
Hayes, Fay A.; and Hayes, Leonard L., 4,204,823, Cl. 425-393.000.

Haygood, Juan C.; and Harman, Ted L., to Ford Motor Company. Keyless entry system. 4,205,325, Cl. 340-147.0MD.

Hayman, Ernest P.: *See*—
Yokoyama, Henry; Hayman, Ernest P.; Hsu, Wan-Jean; and Poling, Stephen M., 4,204,859, Cl. 71-121.000.

Hayman, Richard W., to Stanley Hayman and Company. Interface between data reading wand and cash register display. 4,204,636, Cl. 235-383.000.

Haynes, Keith A. F., to John Hadland (Photograph Instrumentation) Ltd. Closure mechanism such as a camera shutter. 4,204,758, Cl. 354-152.000.

Hayward, Terence J.; and Berrecloth, Alan H. T., to HNL Instruments & Controls Limited. Valves. 4,204,553, Cl. 137-82.000.

Hayward Tyler Limited: *See*—
Richardson, John, 4,204,896, Cl. 156-49.000.

Hazome, Katsuaki: *See*—
Shimazaki, Takaichi; and Hazome, Katsuaki, 4,204,429, Cl. 73-362.0AR.

Healey, David M.: *See*—
Games, John E.; Bitterli, William W.; and Healey, David M., 4,205,381, Cl. 364-505.000.

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Heat Mirror Associates: *See*—
Chahroudi, Day, 4,204,942, Cl. 204-298.000.

Heaton, Harry. Improvements in or relating to epicyclic gear mechanism. 4,204,436, Cl. 74-767.000.

Heberelein Maschinenfabrik AG: *See*—
Luthi, Walter, 4,204,394, Cl. 57-334.000.

Hecht, Gert: *See*—
Bentele, Benedikt; and Hecht, Gert, 4,204,800, Cl. 415-53.00T.

Hechtfischer, Gustav: *See*—
Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, 4,205,078, Cl. 424-274.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Becker, Willi, 4,204,471, Cl. 101-410.000.

Heil, Guenter: *See*—
Barzynski, Helmut; Hartmann, Heinrich; Lautenbach, Dieter; Osterloh, Rolf; Goethlich, Lutz; and Heil, Guenter, 4,205,139, Cl. 525-38.000.

Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Method of thermofixing continuous coupling elements of synthetic-resin monofilament for use in slide-fastener stringers. 4,205,027, Cl. 264-23.000.

Heininger, Richard T.: *See*—
Stiles, Nathan; and Heininger, Richard T., 4,204,286, Cl. 5-11.000.

Heinrich Kuhn Metallwarenfabrik Aktiengesellschaft: *See*—
Kuhn, Jacques, 4,204,609, Cl. 220-408.000.

Helix Technology Corporation: *See*—
Hoyt, Thurber I., 4,204,571, Cl. 165-80.00A.

Helle, Michel: *See*—
Lazzari, Jean-Pierre; and Helle, Michel, 4,204,315, Cl. 29-603.000.

Hemmi, Keiji: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Hemmi, Keiji, 4,205,166, Cl. 544-27.000.

Henderson, Mary M. Coolant band. 4,204,543, Cl. 128-402.000.

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Hennart, Claude; Rabussier, Bernard; Mandon, Jean-Pierre; and Sapin, Joel, to Airwick Industries, Inc. Bait compositions for anthropophilic flies. 4,205,066, Cl. 424-84.000.

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Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,205,006, Cl. 260-410.700.

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Biasotti, Joseph B.; Dorn, Peter; Herbstman, Sheldon; and Dille, Kenneth L., 4,204,841, Cl. 44-71.000.

Herman, Stephen J.: *See*—
Lobdell, Donn D.; Herman, Stephen J.; and Giurtino, Joel F., 4,205,042, Cl. 422-47.000.

Hermann, Hans D.; Ebigt, Joachim; and Hutten, Ulrich M., to Hoechst Aktiengesellschaft. Process for the preparation of polyvinylbutyral having improved properties. 4,205,146, Cl. 525-61.000.

Hermansson, Hans O.; and Jonsson, Bror E., to Nordifa Industritextiller AB. Fashion felt. 4,205,113, Cl. 428-286.000.

Herrmann, Manfred F.: *See—*
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Herscovici, Eva J., to Stauffer Chemical Company. Polymer recovery process. 4,205,162, Cl. 528-499.000.

Hewitt, Malcolm, to British Industrial Plastics Ltd. Moulding machine. 4,204,822, Cl. 425-210.000.

Heynisch, Hinrich, to Siemens Aktiengesellschaft. Wristwatch. 4,204,399, Cl. 368-240.000.

Hidaka, Mikio: *See—*
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,205,010, Cl. 260-465.300.

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Bentall, Simon W., 4,204,360, Cl. 46-98.000.

Hilbert, James F. Method of custom fitting eyeglass frames and article formed thereby. 4,204,750, Cl. 351-130.000.

Hild, Werner: *See—*
Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, 4,204,974, Cl. 252-301.10W.

Hildebrandt, Eugene F.; and Fellner, Herbert G., to Emerson Electric Co. Centrifugal actuator for electric motor starting switch. 4,205,245, Cl. 310-68.00E.

Hill, John A.: *See—*
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,204,540, Cl. 128-283.000.

Hilson, David G.: *See—*
Johnson, Gary W.; and Hilson, David G., 4,205,297, Cl. 338-195.000.

Hirokichi, Komiya: *See—*
Ohki, Yoshinori; and Hirokichi, Komiya, 4,204,490, Cl. 123-102.000.

Hirosawa, Tamio, to Mikuni Kogyo Kabushiki Kaisha. Carburetor. 4,205,024, Cl. 261-34.00R.

Hirota, Kashichi, to Kyowa Electric & Chemical Co., Ltd. Two bottle carrier. 4,204,617, Cl. 224-45.00A.

Hirota, Yoshihisa: *See—*
Inaba, Shizuo; and Hirota, Yoshihisa, 4,204,687, Cl. 274-15.00R.

Hirsch, James A.: *See—*
Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., 4,205,363, Cl. 361-264.000.

Hirtle, Allen C., to Honeywell Information Systems Inc. Trace method and apparatus for use in a data processing system. 4,205,370, Cl. 364-200.000.

Hirvi, Heikki S., to Schoenherr, Leonard. Bouquet holder. 4,204,365, Cl. 47-41.00R.

Hisazawa, Masahide, to Fujitsu Limited. Error detecting system for integrated circuit. 4,205,301, Cl. 371-3.000.

Hishida, Tadashi: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,205,127, Cl. 435-179.000.

Hitachi Iruma Electronic Company Ltd.: *See—*
Shimazaki, Takaichi; and Hazome, Katsuaki, 4,204,429, Cl. 73-362.0AR.

Hitachi, Ltd.: *See—*
Araya, Takeshi; and Udagawa, Tsugio, 4,205,217, Cl. 219-124.340.
Kanai, Hiromi, 4,205,254, Cl. 313-454.000.
Nakagawa, Isao; Nabeyama, Hiroaki; and Kuroyanagi, Tomomitsu, 4,205,335, Cl. 358-31.000.
Oguro, Tomokatsu, 4,205,256, Cl. 315-39.510.
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Ohara, Ichiro, 4,205,250, Cl. 313-242.000.
Oyama, Yoshishige; Yamauchi, Teruo; and Nishimura, Yutaka, 4,205,377, Cl. 364-431.000.
Tomita, Yoshifumi, 4,205,255, Cl. 313-470.000.

Hitachi Seiko Ltd.: *See—*
Araya, Takeshi; and Udagawa, Tsugio, 4,205,217, Cl. 219-124.340.

HNL Instruments & Controls Limited: *See—*
Hayward, Terence J.; and Berrecloth, Alan H. T., 4,204,553, Cl. 137-82.000.

Ho, Eugene Y.; and Musolino, Joseph A., to Techne Electronics, Ltd. Vehicle antitheft alarm. 4,205,300, Cl. 340-65.000.

Hobbs, Charles F.; and McMackins, Dudley E., to Monsanto Company. Asymmetric amination of 1,3-dienes. 4,204,997, Cl. 260-326.800.

Hobbs, Jim F.; and Smyser, Craig. Method of processing activated carbon. 4,204,979, Cl. 252-416.000.

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Watanabe, Masakatsu, 4,205,269, Cl. 455-4.000.

Hodes, Harvey A., to United States of America, Air Force. Low gamma photographic developer. 4,205,124, Cl. 430-456.000.

Hodgkinson, Ian: *See—*
Atherton, John H.; Dobson, Derrick C.; Hodgkinson, Ian; and Clarke, John R. P., 4,204,838, Cl. 23-230.00R.

Hodgson, Thomas D.; Carley-Macauly, Kenneth W.; and Smith, Sidney, to Ciba-Geigy Limited. Process for alkaline scaling. 4,204,953, Cl. 210-58.000.

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Hermann, Hans D.; Ebigt, Joachim; and Hutten, Ulrich M., 4,205,146, Cl. 525-61.000.
Knoblauch, Wolfgang; and von Werner, Konrad, 4,204,972, Cl. 252-78.100.

Hoeschele, Guenther K., to Du Pont de Nemours, E. I., and Company. Copolyetherester based on ethylene oxide-capped poly(propylene oxide) glycol and branching agent. 4,205,158, Cl. 528-300.000.

Hoffman, Simon J. Blade holder for saber saw. 4,204,692, Cl. 279-81.000.

Hoffmann, Harald: *See—*
Schmidt, Klaus; and Hoffmann, Harald, 4,205,108, Cl. 428-147.000.

Hoffmann-La Roche Inc.: *See—*
Barner, Richard; and Hubscher, Joseph, 4,204,995, Cl. 260-239.55C.
Cohen, Noal, 4,205,001, Cl. 260-345.500.

Hoffmann, Lutz: *See—*
Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, 4,204,974, Cl. 252-301.10W.

Hofmann, Otto; and Nagler, Georg, to Tele-Alarm, Nachrichtentechnische Gerate GmbH, Herstellungs-und Vertriebsgesellschaft & Co. KG. Locker installation with a central control unit. 4,204,635, Cl. 235-382.000.

Hofstetter, Franz, to AGFA-Gevaert, A.G. Exposure control system for photographic copying machines. 4,204,734, Cl. 355-68.000.

Hokuriku Pharmaceutical Co., Ltd.: *See—*
Kato, Hideo; and Koshinaka, Eiichi, 4,205,074, Cl. 424-267.000.

Holland, Warren E.; Burley, James D.; and Arendt, Henry P., to Exxon Production Research Company. Sealing retaining ring assembly. 4,204,690, Cl. 277-27.000.

Holstein, John H., to Holstein, John H. Carriage guidance system. 4,204,477, Cl. 104-106.000.

Holtermann, Theodore J., to Outboard Marine Corporation. Lawn mower including means for stopping engine. 4,204,384, Cl. 56-10.500.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Okada, Motohiro, 4,204,703, Cl. 280-734.000.
Tsuboi, Masaharu; and Asaka, Urataro, 4,204,585, Cl. 180-219.000.

Honeywell Inc.: *See—*
Sakurai, Kiyoshi; Matsumoto, Tateo; and Ishikawa, Teruo, 4,205,390, Cl. 364-900.000.

Honeywell Information Systems Inc.: *See—*
Feather, Harvey E., 4,205,371, Cl. 364-200.000.
Hirtle, Allen C., 4,205,370, Cl. 364-200.000.

Hong, Anita L., to Beckman Instruments, Inc. Facile method for isolating resolved amino acids. 4,205,183, Cl. 562-401.000.

Hood, John D.: *See—*
Cole, Martin; Hood, John D.; and Butterworth, Dennis, 4,205,067, Cl. 424-114.000.

Hopfe, Harold H. Wave energy module 2. 4,204,406, Cl. 60-398.000.

Hopp, Leo A., to Column Corporation. General purpose compression-type sprayer. 4,204,645, Cl. 239-341.000.

Horak, Jerry R.; Langworthy, Harold F.; Rauner, Frederick J.; and Gross, Robert C., to Eastman Kodak Company. Solid-state color imaging devices and method for making them. 4,204,866, Cl. 430-306.000.

Horler, Hansulrich: *See—*
Hani, August; Horler, Hansulrich; and Ursprung, Hans, 4,204,586, Cl. 181-229.000.

Hormel, Thad S.: *See—*
Muench, Wayne C.; Hormel, Thad S.; Kirchhoff, Pamela M.; and Robbins, Lanny A., 4,205,188, Cl. 568-764.000.

Horwitz, Norman H. Tool sharpening fixture for a grinding tool. 4,204,371, Cl. 51-141.000.

Hoshida, Katsusuke: *See—*
Mitsuya, Eiji; Kishimoto, Tomio; Hoshida, Katsusuke; and Kamae, Naohiko, 4,205,341, Cl. 358-135.000.

Hoshino, Fumio: *See—*
Hamada, Shinji; Hoshino, Fumio; and Tabata, Junichi, 4,204,736, Cl. 355-118.000.

Hoss, Martin L.: *See—*
Loane, Charles M., Jr.; and Hoss, Martin L., 4,204,864, Cl. 75-257.000.

Hotta, Tadahiko: *See—*
Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,205,334, Cl. 357-41.000.

Hougen, Everett D. Machine for cutting holes with annular cutters. 4,204,783, Cl. 408-68.000.

Houston, Douglas E.; and Loughran, James A., to General Electric Company. Method for thermo-compression diffusion bonding. 4,204,628, Cl. 228-106.000.

Hovan, John J.: *See—*
Faber, Edward S.; Hovan, John J.; and Sinsheimer, Walter J., 4,204,737, Cl. 339-65.000.

Howe, David M., to Rolls-Royce Limited. Combustion systems. 4,204,403, Cl. 60-743.000.

Howe, Dennis G., to Eastman Kodak Company. Frame storage and retrieval wherein the frame fields are quadrature amplitude modulated on a single carrier. 4,205,339, Cl. 179-100.10G.

Howell, Diane, executrix: *See—*
Howell, Louis J., deceased, 4,204,882, Cl. 136-202.000.

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Hoyt, Thurber I., to Helix Technology Corporation. Refrigerator testing assembly. 4,204,571, Cl. 165-80.00A.

Hruby, John O., Jr., to Rain Jet Corporation. Nozzle for canopy-style water fountains. 4,204,631, Cl. 239-17.000.

Hsu, Wan-Jean: *See—*
Yokoyama, Henry; Hayman, Ernest P.; Hsu, Wan-Jean; and Poling, Stephen M., 4,204,859, Cl. 71-121.000.

Huang, Kwang T.: *See—*
Pal, Dharam; Huang, Kwang T.; and Smith, Maurice N., 4,205,235, Cl. 290-44.000.

Hubbard, S. Eugene, to Kawneer Company, Inc. Entrance door system with automatic astragal and panic device. 4,204,369, Cl. 49-319.000.

Huber, Bernhard: *See—*
Tamm, Rolf; Tomoff, Toma; and Huber, Bernhard, 4,204,430, Cl. 73-423.00A.

Hubert, Francois; Laurent, Michel; and Leger, Lucien, to B.F.G. Glassgroup. Manufacture of gas filled envelopes. 4,204,721, Cl. 316-19.000.

Hubscher, Joseph: *See—*
Barner, Richard; and Hubscher, Joseph, 4,204,995, Cl. 260-239.55C.

Humme, Gert: *See—*
Liebig, Lothar; Wingler, Frank; Humme, Gert; and Prinz, Richard, 4,205,141, Cl. 525-67.000.

Hummel, Matt N., to Acra Electric Corporation. Method of manufacture of a heater band. 4,204,316, Cl. 29-61.00N.

Hunter, Edwin J., to Toro Company, The. Traveling sprinkler system and method. 4,204,642, Cl. 239-191.000.

Hurlong, Granville, Jr.: *See—*
Casey, Gary L.; and Hurlong, Granville, Jr., 4,204,507, Cl. 123-139.0AW.

Hurter, Wilfried: *See—*
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Hussar, John F.: *See—*
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Husted, Royce H., to Saroy Engineering. Snowfoil ski-bob. 4,204,581, Cl. 180-190.000.

Hutten, Ulrich M.: *See—*
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Hydragon Corporation, The: *See—*
Earnest, Ernest R., 4,204,401, Cl. 60-39.030.

Hymes, Richard H. Tapeless joint compound. 4,205,041, Cl. 264-261.000.

Iannadrea, Gerald; Gorgone, Robert L.; and Kovach, Alan J., to Ardac, Inc. Apparatus for testing colored securities. 4,204,765, Cl. 356-71.000.

Iannarone, Ronald: *See—*
Blackwood, John; and Iannarone, Ronald, 4,204,493, Cl. 112-260.000.

Ibsen, Robert L.; Glace, William R.; and Reed, William R., Jr., to Den-Mat, Inc. Tooth crack detector. 4,204,978, Cl. 252-408.000.

Ichikura, Yoshifumi: *See—*
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Ichimura, Yoshiaki: *See—*
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Idemitsu Petrochemical Co. Ltd.: *See—*
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Ignasiak, Stanley F.: *See—*
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Ignatiev, Stanislav N.: *See—*
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.

Iida Denki Kogyo K.K.: *See—*
Ohki, Yoshinori; and Hirokichi, Komiya, 4,204,490, Cl. 123-102.000.

Ikariyama, Takehiro: *See—*
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Ikegami, Yoshio; Kohge, Tadashi; Kawahara, Masakatsu; and Kimura, Hirofumi, to Kobe Steel, Ltd. Steel-pipe coating apparatus. 4,204,496, Cl. 118-405.000.

Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, to Kabushiki Kaisha Daini Seikosha. Calendar mechanism of a portable timepiece. 4,204,395, Cl. 368-35.000.

Illinois Cereal Mills: *See—*
Swarthout, E. Jack; and Antholz, Phillip, 4,204,983, Cl. 260-17.4GC.

Imai, Nobuo: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,205,127, Cl. 435-179.000.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Method of focussing in a photographic lens system. 4,204,747, Cl. 350-216.000.

Imaizumi, Fumio: *See—*
Ushioda, Katsuyoshi; and Imaizumi, Fumio, 4,204,819, Cl. 425-72.00R.

IMED Corporation: *See—*
Cannon, Raymond E., 4,204,538, Cl. 128-214.00R.

Imperial Camera Corp.: *See—*
Irwin, George; and Irwin, Mark, 4,204,757, Cl. 354-135.000.

Imperial Chemical Industries Limited: *See—*
Atherton, John H.; Dobson, Derrick C.; Hodgkinson, Ian; and Clarke, John R. P., 4,204,838, Cl. 23-230.00R.
Baldwin, Brian C.; Shephard, Margaret C.; and Skidmore, Anthony M., 4,205,075, Cl. 424-269.000.
Barlow, William A.; Rhodes, Maurice; Sherliker, Francis R.; and Williams, Edward W., 4,204,933, Cl. 204-181.00N.
Boulton, Thomas W.; and Darwent, Brian J., 4,204,939, Cl. 204-258.000.
Bowden, Roy D.; and Seaton, Thomas, 4,205,175, Cl. 546-345.000.
Brydon, Donald L., 4,205,038, Cl. 264-184.000.
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,205,020, Cl. 525-275.000.
Ness, Norman M., 4,205,101, Cl. 427-233.000.
Parker, David G.; and Tompsett, Alan J., 4,205,012, Cl. 260-583.00J.
Waring, Wilson S., 4,205,087, Cl. 424-317.000.

Inaba, Shizuo; and Hirota, Yoshihisa, to Pioneer Electronic Corporation. Tone arm drive device. 4,204,687, Cl. 274-15.00R.

Independent Television Companies Association: *See—*
Barrett, James H., 4,205,343, Cl. 358-147.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Tomada, Franco, 4,205,352, Cl. 360-45.000.

Ingersoll Steel Company: *See—*
Berg, Erik E.; and Tingwall, Rolf, 4,204,884, Cl. 148-2.000.

Inokuchi, Hiroo; Murano, Kentaro; Kawazura, Hiroshi; and Kobayashi, Tsutomu, to Japan Synthetic Rubber Company, Limited. Process for ortho-para-hydrogen conversion. 4,205,056, Cl. 423-649.000.

Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Transmitting and copying machine. 4,204,729, Cl. 355-11.000.

Inokuchi, Toshiyuki: *See—*
Kawazu, Motoaki; Yokota, Takashi; Inokuchi, Toshiyuki; and Kanmoto, Yoshiaki, 4,205,349, Cl. 358-294.000.

Inoue, Hiroshi: *See—*
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Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,205,213, Cl. 219-69.00W.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electrical discharge machining with a vibrating wire electrode. 4,205,213, Cl. 219-69.00W.

Inoue, Yuichiro; and Sakaki, Masamichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Pressure measuring device. 4,204,422, Cl. 73-4.00R.

Inouye, Tamon; and Mizutani, Hiroyuki, to Tokyo Shibaura Electric Co., Ltd. Method and apparatus for performing computed tomography. 4,205,375, Cl. 364-414.000.

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Popovici, Neculai, 4,205,046, Cl. 422-193.000.

Instruments S.A.: *See—*
Laude, Jean-Pierre, 4,204,638, Cl. 235-454.000.

Instytut Badan Jadrowych: *See—*
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Instytut Przemyslu Maszyn Wiazacych Materialow Budowlanych: *See—*
Nowak, Edmund; Zamojdo, Rudolf; Parda, Andrzej; Kurdowski, Wieslaw; and Jankowski, Stefan, 4,204,836, Cl. 432-58.000.

International Business Machines Corporation: *See—*
Bardsley, Henry, III; Luiz, Fernando A.; Nilsen, Nils F.; and Simpson, Ronald C., 4,205,374, Cl. 364-200.000.
Barnhart, Carl F., 4,205,303, Cl. 340-347.0DA.
Barsuhn, Horst E.; Olderdissen, Ulrich; and Schmidt, Werner, 4,204,634, Cl. 371-38.000.
DiStefano, Thomas H.; and Kuhn, Lawrence, 4,204,725, Cl. 355-3.00R.
Goel, Prabhakar, 4,204,633, Cl. 371-27.000.
Patel, Arvind M., 4,205,324, Cl. 371-50.000.

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Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,205,186, Cl. 568-600.000.

Inui, Taiji: *See—*
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Invernizzi, Renzo; Ligorati, Ferdinando; and Fontanesi, Maurizio, to Euteco S.p.A. Supported catalysts for the homo- and co-polymerization of α-olefines. 4,204,981, Cl. 252-429.00B.

Iovdalsky, Nikolai V.: *See—*
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Iribe, Seiki: *See—*
Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,204,930, Cl. 204-180.00P.

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Irwin, George; and Irwin, Mark, to Imperial Camera Corp. Flash lamp operating mechanism. 4,204,757, Cl. 354-135.000.

Irwin, Mark: *See—*
Irwin, George; and Irwin, Mark, 4,204,757, Cl. 354-135.000.

Iseki Agricultural Machinery Mfg. Co., Ltd.: *See—*
Tanaka, Shinta, 4,204,590, Cl. 192-99.00R.
Tani, Mitsuhiro; and Watanabe, Hideo, 4,204,591, Cl. 192-99.00R.

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Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
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Ishida, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Split operation type multi-cylinder internal combustion engine. 4,204,514, Cl. 123-198.00F.

Ishikawa, Teruo: *See—*
Sakurai, Kiyoshi; Matsumoto, Tateo; and Ishikawa, Teruo, 4,205,390, Cl. 364-900.000.

Ishikura, Shin-ichi: *See—*
Mizuguchi, Ryuzo; Takahashi, Atsushi; Ishikura, Shin-ichi; and Uenaka, Akimitsu, 4,205,152, Cl. 526-265.000.

Ishimatsu, Yoshiaki; Shigesada, Shigeki; Suzuki, Hiroyasu; Kitagawa, Hironoshin; and Kimura, Shoji, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing immobilized enzyme compositions. 4,205,128, Cl. 435-182.000.

Isola, Raymond O. Firearm cartridge receiver. 4,204,353, Cl. 42-1.00T.

Ito, Hiromi: *See—*
Kato, Yutaka; Tokitoh, Hirohiko; Kitahara, Tomohiro; and Ito, Hiromi, 4,204,767, Cl. 356-444.000.

Itoh, Tsutomu: *See—*
Yamamoto, Masahiro; Okamoto, Yasunari; Itoh, Tsutomu; and Masuda, Senichi, 4,205,359, Cl. 361-58.000.

Iuchi, Keiko: *See—*
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,205,156, Cl. 528-117.000.

Ivancic, Emil. Apparatus for applying coating liquid to articles. 4,204,498, Cl. 118-693.000.

Iwatsu Electric Co. Ltd.: *See—*
Eishima, Tetsusuke; Ikariyama, Takehiro; Jinnouchi, Raizo; Oyagi, Kunioki; and Soda, Takashi, 4,205,206, Cl. 179-124.000.

Izumi, Yusuke; Maekawa, Junji; and Suzuki, Katsumi, to Celanese Corporation. Process for preparing ethyl esters of aliphatic carboxylic acids. 4,205,182, Cl. 560-247.000.

J. Bobst & Fils, S.A.: *See—*
Grivet, Francis, 4,204,672, Cl. 271-188.000.

J. I. Case Company: *See—*
Baylor, John M., 4,204,716, Cl. 305-11.000.
Schlapman, William J., 4,204,293, Cl. 15-79.00R.

Jachna, Waclaw: *See—*
Jedo, Antoni; and Jachna, Waclaw, 4,204,949, Cl. 209-250.000.

Jackson, Arthur: *See—*
Elton, Michael J.; Jackson, Arthur; and Harrison, John W., 4,205,185, Cl. 562-444.000.

Jacob, Jose T., to Chemed Corporation. Detoxification of residual quaternaries. 4,204,954, Cl. 210-59.000.

Jacob Schlaepfer & Co. AG: *See—*
Schlaepfer, Robert J., 4,204,610, Cl. 221-1.000.

Jacobs, Philip C., Jr., to Gould Inc. Solderless fuse terminal. 4,205,294, Cl. 337-234.000.

Jacobson, Carl C.; and Crosby, Gaius P., to Crafco, Inc. Pavement cutting machine with pad to stabilize and brake machine. 4,204,714, Cl. 299-1.000.

Jacobson, Robert L.; and Gibson, Kirk R., to Chevron Research Company. Process for the removal of thiols from hydrocarbon oils. 4,204,947, Cl. 208-243.000.

Jahn, Ulrich: *See—*
Schatz, Franz; Stammbach, Christian; Thiele, Kurt; Wagner-Jauregg, Theodor W.; Zirngibl, Ludwig; Fischer, Johanna; and Jahn, Ulrich, 4,204,998, Cl. 260-326.150.

Jahn, Walter; and Schumann, Werner, to Jenaer Glaswerk Schott & Gen. Glass for radio-photoluminescence dosimetry. 4,204,976, Cl. 252-301.40P.

Jamieson, John W.: *See—*
Lee, Sen L.; Shah, Franklin B.; and Jamieson, John W., 4,204,779, Cl. 400-144.200.

Janick, Jules; and Pence, Valerie C., to Purdue Research Foundation. Method of non-agricultural production of cotyledons. 4,204,366, Cl. 47-58.000.

Jankowski, Stefan: *See—*
Nowak, Edmund; Zamojdo, Rudolf; Parda, Andrzej; Kurdowski, Wieslaw; and Jankowski, Stefan, 4,204,836, Cl. 432-58.000.

Japan Aviation Electronics Industry, Ltd.: *See—*
Yasui, Hiroshi; and Ichimura, Yoshiaki, 4,204,722, Cl. 339-17.0CF.

Japan Exlan Company Limited: *See—*
Fujimatsu, Masaaki, 4,205,037, Cl. 264-182.000.

Japan Synthetic Rubber Company, Limited: *See—*
Harada, Tetsuya, 4,205,192, Cl. 585-363.000.
Inokuchi, Hiroo; Murano, Kentaro; Kawazura, Hiroshi; and Kobayashi, Tsutomu, 4,205,056, Cl. 423-649.000.

Jaron, Dov: *See—*
Martin, Peter J.; and Jaron, Dov, 4,204,524, Cl. 128-1.00D.

Jaschke, Hans; Kautz, Rudolf; Plate, Hermann; and Ulb, Horst, to Dynamit Nobel Aktiengesellschaft. Endless composite sheet material. 4,205,107, Cl. 428-58.000.

Jean, Raymond W. Surface coverings for walls, ceilings and the like. 4,205,110, Cl. 428-213.000.

Jeanson, Rene H., to Societe Anonyme Francaise du Ferodo. Homokinetic transmission. 4,204,411, Cl. 64-2.00P.

Jedo, Antoni; and Jachna, Waclaw, to Centralny Osrodek Projektowokonstrukcyjny Maszyn Gorniczych KOMAG. Device for wet classification of a mixture of solid components according to size. 4,204,949, Cl. 209-250.000.

Jen, Tai-Kuang, to NCR Corporation. Matrix printer control system. 4,204,777, Cl. 400-124.000.

Jenaer Glaswerk Schott & Gen: *See—*
Jahn, Walter; and Schumann, Werner, 4,204,976, Cl. 252-301.40P.

Jenkins, Robert W., Jr.: *See—*
Newman, Richard H.; Jones, William L., Jr.; and Jenkins, Robert W., Jr., 4,204,550, Cl. 131-171.00R.

Jensen, Knud B.: *See—*
Braad, Poul E.; Jensen, Knud B.; Rosendal, Hans; and Sevaldsen, Flemming, 4,204,415, Cl. 72-52.000.

Jensen, Stig K. Mincing machine. 4,204,647, Cl. 241-82.600.

Jilla, Dara A. Process for the rapid, continuous novel texturing or textile materials and novel-textured textile materials. 4,204,290, Cl. 8-478.000.

Jinnouchi, Raizo: *See—*
Eishima, Tetsusuke; Ikariyama, Takehiro; Jinnouchi, Raizo; Oyagi, Kunioki; and Soda, Takashi, 4,205,206, Cl. 179-124.000.

Johann, Maier, to Schwarzkopf Development Corporation. Clamping toolholder. 4,204,781, Cl. 407-105.000.

Johannes, Gunter; and Pfeiffer, Hans-Dieter, to Continental Gummi-Werke Aktiengesellschaft. Tread structure for pneumatic vehicle tires. 4,204,567, Cl. 152-209.00D.

Johansson, Inge, to Defibrator Aktiebolag. Sealing device for shafts. 4,204,689, Cl. 277-27.000.

John Hadland (Photograph Instrumentation) Ltd.: *See—*
Haynes, Keith A. F., 4,204,758, Cl. 354-152.000.

John, Hans-Erich: *See—*
Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, 4,204,974, Cl. 252-301.10W.

John Lysaght (Australia) Limited: *See—*
Maricic, Alexander, 4,204,712, Cl. 296-35.100.

Johns-Manville Corporation: *See—*
Burger, Anthony J., Jr., 4,204,696, Cl. 280-79.10R.

Johnson, Conrad B., to Turbo Resources Ltd. Process for removing metal contaminants from used lubricating oils. 4,204,946, Cl. 208-181.000.

Johnson, Evan R.; and Tanner, David E., to United States of America, Energy. Valve assembly having remotely replaceable bearings. 4,204,558, Cl. 137-315.000.

Johnson, Gary W.; and Hilson, David G., to Electro Materials Corp. of America. Film type resistor and method of producing same. 4,205,297, Cl. 338-195.000.

Johnson, Howard L., to Caterpillar Tractor Co. Combination check and flow control valve for hydraulic systems. 4,204,459, Cl. 91-445.000.

Johnson, John A. Carton brander. 4,204,469, Cl. 101-9.000.

Johnson, John N.; and Lindenberger, Charles J. Denture hold apparatus. 4,204,322, Cl. 433-185.000.

Johnson & Johnson: *See—*
Vidra, James D., 4,205,061, Cl. 424-55.000.

Johnson, Mark; and Ulrich, Reinhard, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Fiber-optic circuit element. 4,204,742, Cl. 350-96.200.

Johnson, Mark U.; Rothmayer, Jules; and Smith, Hugh M., to Sun Chemical Corporation. Printing inks containing nucleated organic pigments. 4,204,871, Cl. 106-20.000.

Johnson Products Co., Inc.: *See—*
Khalil, Ezzat N.; and Syed, Ali N., 4,205,063, Cl. 424-70.000.

Johnson, Richard V.: *See—*
DeBenedictis, Leonard C.; and Johnson, Richard V., 4,205,348, Cl. 358-285.000.

Johnston, Gordon L., to Donaldson Company, Inc. Discharge valve assembly for multiple-stage dust collector. 4,204,849, Cl. 55-310.000.

Jones, Clyde K. Three dimensional alignment game. 4,204,685, Cl. 273-241.000.

Jones, Leith; and McGrath, N. Christian, to Sprague Electric Company. Method for making terminal bumps on semiconductor wafers. 4,205,099, Cl. 427-90.000.

Jones, Maurice, to David Brown Tractors Limited. Internal combustion engines. 4,204,487, Cl. 123-41.350.

Jones, William L., Jr.: *See—*
Newman, Richard H.; Jones, William L., Jr.; and Jenkins, Robert W., Jr., 4,204,550, Cl. 131-171.00R.

Jones, William M.; and Freas, Mark S., to North American Manufacturing Company, The. Method and apparatus for controlling burner-air-fuel ratio. 4,204,830, Cl. 431-8.000.

Jongsma, Cornelis, to Stamicarbon, B.V. Method for processing a tar containing benzyl benzoate. 4,205,184, Cl. 562-494.000.

Jonsson, Bror E.: *See—*
Hermansson, Hans O.; and Jonsson, Bror E., 4,205,113, Cl. 428-286.000.

Jordan, John H., to Mobil Oil Corporation. Chromatograph. 4,204,423, Cl. 73-23.100.

Joumas, George E.: *See—*
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Juillard, Michel: *See*—
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Jullien, Antonin: *See*—
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Morel, Pierre; Ortega, Yasmine; Jullien, Claudette; and Jullien, Antonin, 4,204,842, Cl. 48-197.00A.
Jundt, Werner; Bodig, Bernd; Roozenbeek, Herman; and Werner, Peter, to Robert Bosch GmbH. Ignition system for internal combustion engine. 4,204,508, Cl. 123-148.00E.
Kabirov, Albert G.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Asano, Kazuhiro; Ueda, Makoto; Torisawa, Akira; Shida, Masaharu; Satoh, Katsuhiko; and Mandai, Masaaki, 4,204,397, Cl. 368-202.000.
Asano, Kazuhiro, 4,205,369, Cl. 363-62.000.
Fukushima, Yasuhiro, 4,205,244, Cl. 310-49.00R.
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,204,395, Cl. 368-35.000.
Morohoshi, Fumio; and Hasegawa, Yoshio, 4,204,400, Cl. 84-484.000.
Shida, Masaharu, 4,205,262, Cl. 318-696.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Aoshiba, Norihiro, 4,204,794, Cl. 414-723.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Miyazawa, Yoshinori; and Gomi, Yoshifumi, 4,204,778, Cl. 400-124.000.
Negita, Mutsumi, 4,205,248, Cl. 310-370.000.
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Kado, Satoshi; Yamazaki, Taketomo; Sakamoto, Tetsu; Yamanaka, Mikio; and Yoshida, Kotaro, to Nippon Steel Corporation. Austenitic heat-resistant steel which forms Al_2O_3 film in high-temperature oxidizing atmosphere. 4,204,862, Cl. 75-124.000.
Kaelble, David H., to Arroyo Research and Consulting Company. Orthodontic bracket bonding system. 4,204,325, Cl. 433-9.000.
Kaelin, Joseph Richard, to Union Carbide Corporation. Method and apparatus for treatment of sludge. 4,204,958, Cl. 210-178.000.
Kagan, Jacques, to University of Illinois Foundation, The. Dibenzooxa-bicyclonona-2,6-dienes. 4,205,000, Cl. 260-345.200.
Kahn, Henry, to Kahn, Henry. Rubber dam holder for use during endodontic therapy. 4,204,329, Cl. 433-136.000.
Kahn, Leonard R. Method and means for reducing intelligible crosstalk in telephone systems. 4,205,201, Cl. 370-81.000.
Kahn, Leonard R. Method and means for improving the spectrum utilization of multichannel telephone systems. 4,205,202, Cl. 370-81.000.
Kakizaki, Takehiro; Tagawa, Susumu; and Sawai, Masahide, to Sony Corporation. Elimination of landing errors in electron-optical system of mixed field type. 4,205,253, Cl. 313-437.000.
Kali-Chemie Aktiengesellschaft: *See*—
Thies, Peter W., 4,205,083, Cl. 424-283.000.
Kalina, Robert F., to Western Electric Company, Inc. Boxed capacitor with bimetallic terminals and method of making. 4,205,365, Cl. 361-308.000.
Kama, Haruo: *See*—
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
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Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Hemmi, Keiji, to Fujisawa Pharmaceutical Co., Ltd. 7-Substituted-3-aminoalkyl-, acylaminoalkyl-, or hydroxyalkyl-substituted heterocyclic thiomethyl-3-cephem-4-carboxylic acid derivatives and preparation thereof. 4,205,166, Cl. 544-27.000.
Kamo, Yohichi. Sewage pump assembly. 4,204,801, Cl. 415-121.00G.
Kanai, Hiromi, to Hitachi, Ltd. Electron gun for a cathode ray tube. 4,205,254, Cl. 313-454.000.
Kane, Michael J. Articulated fishing drum. 4,204,354, Cl. 43-4.500.
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Kanno, Tominori: *See*—
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Kapitanov, Nikolai N. Surgical instrument for stitching up soft tissues with lengths of spiked suture material. 4,204,541, Cl. 128-334.00R.
Kappes, Alfred: *See*—
Harlfinger, Rudolf; Ehehalt, Theobald; and Kappes, Alfred, 4,204,924, Cl. 204-129.350.
Kappler, Gunter: *See*—
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Karch, John A.: *See*—
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Karlsson, Berit: *See*—
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Karlsson, Rune; and Karlsson, Berit. Anti-lick ring for automatic drinking troughs for animals. 4,204,501, Cl. 119-72.000.
Kasei Optonix, Ltd.: *See*—
Suzuki, Yujiro; Shimiya, Keiji; and Miyagawa, Takashi, 4,205,234, Cl. 250-483.000.
Kasprzyk, Martin R.: *See*—
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Kato, Hideo; and Koshinaka, Eiichi, to Hokuriku Pharmaceutical Co., Ltd. Anti-spasmodic substituted quinolizidine and indolizidine compounds. 4,205,074, Cl. 424-267.000.
Kato, Hiroshi; and Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for recovering modified polyvinyl alcohols from aqueous solution containing them. 4,205,147, Cl. 525-62.000.
Kato, Yoshio: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,205,134, Cl. 521-53.000.
Kato, Yutaka; Tokitoh, Hirohiko; Kitahara, Tomohiro; and Ito, Hiromi, to Olympus Optical Co., Ltd. Automatic cataphoresis apparatus. 4,204,767, Cl. 356-444.000.
Kautz, Rudolf: *See*—
Jaschke, Hans; Kautz, Rudolf; Plate, Hermann; and Ulb, Horst, 4,205,107, Cl. 428-58.000.
Kawada, Izumi: *See*—
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Kawagai, Kenji; and Yoshida, Shigeki, to Tokyo Shibaura Electric Co., Ltd. Temperature compensated constant current MOS field effective transistor circuit. 4,205,263, Cl. 323-22.00R.
Kawahara, Masakatsu: *See*—
Ikegami, Yoshio; Kohge, Tadashi; Kawahara, Masakatsu; and Kimura, Hirofumi, 4,204,496, Cl. 118-405.000.
Kawai, Mitsuo; and Ono, Hironobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Basic air-fuel ratio adjustment method and apparatus. 4,204,505, Cl. 123-119.0EC.
Kawakama, Motoaki: *See*—
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Kawata, Shunichi: *See*—
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Kawazoe, Akio: *See*—
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Kawazu, Motoaki; Yokota, Takashi; Inokuchi, Toshiyuki; and Kanmoto, Yoshiaki, to Ricoh Company, Ltd. Optoelectronic scanning apparatus. 4,205,349, Cl. 358-294.000.
Kawazura, Hiroshi: *See*—
Inokuchi, Hiroo; Murano, Kentaro; Kawazura, Hiroshi; and Kobayashi, Tsutomu, 4,205,056, Cl. 423-649.000.
Kawecki, Henry E. Wheelchair braking apparatus. 4,204,588, Cl. 188-2.00F.
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Hubbard, S. Eugene, 4,204,369, Cl. 49-319.000.
Kayahara, Hirohumi: *See*—
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Kelly, Walter F. Two-ply duct core. 4,204,562, Cl. 138-132.000.
Kendall, Robert M.; Kesselring, John P.; and Krill, Wayne V., to Acurex Corporation. Catalytic combustion process and system. 4,204,829, Cl. 431-7.000.
Kennametal Inc.: *See—*
McCray, David M.; and Murray, Gerald D., 4,204,787, Cl. 409-234.000.
Kennecott Copper Corporation: *See—*
Smith, Richard D., 4,204,883, Cl. 148-2.000.
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Thiele, Dietrich, 4,204,975, Cl. 252-301.10W.
Kersting, Emil F.; and Schulte, Rolf, to SACK GmbH. Flying cropping shears for hot strip. 4,204,449, Cl. 83-328.000.
Kervagoret, Gilbert, to Societe Anonyme D.B.A. Torque-amplifying hydraulic servo-mechanism, particularly for power steering systems in motor vehicles. 4,204,817, Cl. 418-248.000.
Kesselring, John P.: *See—*
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Keuffel & Esser Company: *See—*
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Khalil, Ezzat N.; and Syed, Ali N., to Johnson Products Co., Inc. Low irritant conditioning shampoo composition. 4,205,063, Cl. 424-70.000.
Khutoretsky, Garri M.; Fridman, Vladimir M.; Zagorodnaya, Galina A.; Vorontsov, Alexandr I.; Ignatiev, Anatoly D.; and Sudarikov, Vasily L. Method of assembling stator core of electric machine inside the housing thereof. 4,204,313, Cl. 29-596.000.
Kibby, Robert M., to Reynolds Metals Company. Magnesium production. 4,204,860, Cl. 75-10.00R.
Kiefer, Gunther: *See—*
Schulmeister, Robert; Edmaier, Franz; and Kiefer, Gunther, 4,204,848, Cl. 55-269.000.
Kikuchi, Makoto, to Toyoda Koki Kabushiki Kaisha. Workpiece loading apparatus. 4,204,441, Cl. 82-2.500.
Kilcher, Beat: *See—*
Ullmann, Werner; Buhler, Ernst; Kilcher, Beat; Ruh, Herbert; and Sieg, Arno, 4,205,212, Cl. 219-69.00W.
Kimura, Hirofumi: *See—*
Ikegami, Yoshio; Kohge, Tadashi; Kawahara, Masakatsu; and Kimura, Hirofumi, 4,204,496, Cl. 118-405.000.
Kimura, Shoji: *See—*
Ishimatsu, Yoshiaki; Shigesada, Shigeki; Suzuki, Hiroyasu; Kitagawa, Hironoshin; and Kimura, Shoji, 4,205,128, Cl. 435-182.000.
Kimura, Tatsuya: *See—*
Sakai, Junichi; and Kimura, Tatsuya, 4,204,745, Cl. 350-96.310.
King, Arthur S. Apparatus for producing foam. 4,204,940, Cl. 204-272.000.
King Instrument Corporation: *See—*
King, James L., 4,204,898, Cl. 156-159.000.
King, James L., to King Instrument Corporation. Tape winding and splicing machine. 4,204,898, Cl. 156-159.000.
Kinkead, Jordan A.: *See—*
Reed, Steven P.; and Kinkead, Jordan A., 4,204,618, Cl. 225-106.000.
Kirbis, Manfred; Schilde, Peter; and Englmaier, Gert, to Danfoss A/S. Apparatus for retracting the stator coil of an electric motor. 4,204,318, Cl. 29-734.000.
Kirchdorffer, Gerhard: *See—*
Fehler, Adolf; Kirschey, Gunter; Kappler, Gunter; and Kirchdorffer, Gerhard, 4,204,404, Cl. 60-740.000.
Kirchhoff, Gertrud: *See—*
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, 4,204,867, Cl. 430-376.000.
Kirchhoff, Pamela M.: *See—*
Muench, Wayne C.; Hormel, Thad S.; Kirchhoff, Pamela M.; and Robbins, Lanny A., 4,205,188, Cl. 568-764.000.
Kirkpatrick, Joel L., to Gulf Oil Corporation. Carbamyltriazole insecticides. 4,205,177, Cl. 548-265.000.
Kirrish, Hail; and McCauley, Jon R., to Textron Inc. Screw and captive compression spring fastener assembly. 4,204,566, Cl. 151-38.000.
Kirschey, Gunter: *See—*
Fehler, Adolf; Kirschey, Gunter; Kappler, Gunter; and Kirchdorffer, Gerhard, 4,204,404, Cl. 60-740.000.
Kirst, Herbert A., to Eli Lilly and Company. Antibiotic A201C, A201D and A201E. 4,205,164, Cl. 542-421.000.
Kishimoto, Tomio: *See—*
Mitsuya, Eiji; Kishimoto, Tomio; Hoshida, Katsusuke; and Kamae, Naohiko, 4,205,341, Cl. 358-135.000.
Kitagawa, Hironoshin: *See—*
Ishimatsu, Yoshiaki; Shigesada, Shigeki; Suzuki, Hiroyasu; Kitagawa, Hironoshin; and Kimura, Shoji, 4,205,128, Cl. 435-182.000.
Kitahara, Tomohiro: *See—*
Kato, Yutaka; Tokitoh, Hirohiko; Kitahara, Tomohiro; and Ito, Hiromi, 4,204,767, Cl. 356-444.000.
Kitazume, Shooji: *See—*
Morikawa, Hiroyuki; and Kitazume, Shooji, 4,205,193, Cl. 585-367.000.
Klein, Thomas, to National Semiconductor Corporation. Method of manufacturing a low voltage n-channel MOSFET device. 4,205,330, Cl. 357-23.000.
Klenk, Emil, to Maschinenbau Oppenweiler GmbH. Semi-circular stack sheet feeding apparatus. 4,204,667, Cl. 271-3.100.
Klesse, Fritz; and Forster, Jurgen, to Resista Fabrik Elektrischer Widerstande G.m.b.H. Thin-film resistor and process for the production thereof. 4,204,935, Cl. 204-192.00F.
Klesse, Fritz; and Forster, Jurgen. Thin film resistor. 4,205,299, Cl. 338-308.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Matzen, Max, 4,204,814, Cl. 417-437.000.
Klose, Peter H.: *See—*
Ovshinsky, Stanford R.; Klose, Peter H.; and Messing, Wayne P., 4,205,387, Cl. 364-900.000.
Kluger, Wolfgang: *See—*
Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, 4,204,974, Cl. 252-301.10W.
Kmetz, Edward R.; and Joumas, George E., to Scotty Vent Dampers. Safety control for furnace burner. 4,204,833, Cl. 431-22.000.
Knecht, Helmut, to Adams Industries, Inc. Steam and hot liquid dispensing device. 4,204,465, Cl. 99-293.000.
Knigge, Vincent L.: *See—*
Shim, Norman; and Knigge, Vincent L., 4,205,238, Cl. 235-92.0CT.
Knippenberg, Wilhelmus F.: *See—*
Lersmacher, Bernhard; Lydtin, Hans; Schelhas, Karlheinz; and Knippenberg, Wilhelmus F., 4,204,769, Cl. 356-244.000.
Knobiauch, Wolfgang; and von Werner, Konrad, to Hoechst Aktiengesellschaft; and Teves, Alfred. Hydraulic fluids comprising nitrogen-containing boric acid esters. 4,204,972, Cl. 252-78.100.
Knochel, E. Stanley. Work table and hold-down assembly for power hand saw. 4,204,446, Cl. 83-146.000.
Knott, Philip H. Liquid containing amusement device. 4,204,363, Cl. 46-202.000.
Ko, Raymond, to American Air Filter Company, Inc. Mist eliminator device for a wet scrubber apparatus. 4,204,847, Cl. 55-257.0PV.
Kobayashi, Haro, to Minolta Camera Kabushiki Kaisha. Focus adjusting device for self-contained interchangeable lens camera. 4,204,760, Cl. 354-197.000.
Kobayashi, Shuji; Aoyagi, Mitsuo; Kanno, Tominori; Ueno, Kazuei; and Nomura, Shin-ichi, to Stanley Electric Co., Ltd. Selenium pellets for use in vacuum-deposition and method of producing such pellets. 4,205,098, Cl. 427-76.000.
Kobayashi, Tsutomu: *See—*
Inokuchi, Hiroo; Murano, Kentaro; Kawazura, Hiroshi; and Kobayashi, Tsutomu, 4,205,056, Cl. 423-649.000.
Kobayashi, Yasutoshi: *See—*
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Hideo, 4,205,148, Cl. 525-379.000.
Kobe Steel, Ltd.: *See—*
Ikegami, Yoshio; Kohge, Tadashi; Kawahara, Masakatsu; and Kimura, Hirofumi, 4,204,496, Cl. 118-405.000.
Kobori, Toshio; Sahara, Masayoshi; and Saito, Mitsuru, to Minolta Camera Kabushiki Kaisha. Camera exposure factor indicating device. 4,204,756, Cl. 354-53.000.
Koch, Volker: *See—*
Henkler, Herbert; Koenig, Roland; Deichelmann, Hermann; and Koch, Volker, 4,205,393, Cl. 365-133.000.
Koeneman, James B., to Lord Corporation. Joint prosthesis with contoured pin. 4,204,284, Cl. 3-1.910.
Koenig & Bauer Aktiengesellschaft: *See—*
Kutzner, Willi A. P.; and Schneider, Georg, 4,204,626, Cl. 227-81.000.
Kutzner, Willi A. P.; and Schneider, Georg, 4,204,627, Cl. 227-81.000.
Koenig, Roland: *See—*
Henkler, Herbert; Koenig, Roland; Deichelmann, Hermann; and Koch, Volker, 4,205,393, Cl. 365-133.000.
Kohge, Tadashi: *See—*
Ikegami, Yoshio; Kohge, Tadashi; Kawahara, Masakatsu; and Kimura, Hirofumi, 4,204,496, Cl. 118-405.000.
Kohler, Robert; Muller, Jorn; Giglberger, Dieter; and Bestenreiner, Freidrich, to Agfa-Gevaert, A.G. Apparatus for electrophotographic copying with means for effecting image penetration through the copy carriers. 4,204,731, Cl. 355-16.000.
Kohn, Jean, to Baltek Corporation. Method of producing thin balsa wood sheets. 4,204,900, Cl. 156-255.000.
Kohr, John M. Band saw guard device. 4,204,444, Cl. 83-56.000.
Kojima, Minoru: *See—*
Ohashi, Takashi; Kojima, Minoru; Yoshida, Masako; Okuyama, Toru; and Sakata, Ryozo, 4,205,136, Cl. 521-118.000.
Kokusan Denki Co., Ltd.: *See—*
Nanjo, Hirotoshi; and Watanabe, Takeshi, 4,204,509, Cl. 123-148.00E.
Kolene Corp.: *See—*
Bens, Frederick P., 4,204,886, Cl. 148-15.500.
Kolling, Georg: *See—*
Kroger, Carl; Romey, Ingo; and Kolling, Georg, 4,205,035, Cl. 264-120.000.

Kolm, Henry H.: *See*—
Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., 4,204,948, Cl. 209-223.00R.

Komatsu, Yoshimasa: *See*—
Suzuki, Takao; Komatsu, Yoshimasa; Takeda, Akimichi; and Baba, Toshihiko, 4,205,214, Cl. 219-97.000.

Komeda, Tadao; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Process for fabrication of semiconductors utilizing selectively etchable diffusion sources in combination with melt-flow techniques. 4,204,894, Cl. 148-188.000.

Komiya, Yutaka: *See*—
Goshima, Yoshitomo; Kawakubo, Kazuo; Furuichi, Katsushi; Sakamaki, Hisashi; Sawamura, Osamu; Komiya, Yutaka; and Tomosada, Masahiro, 4,204,728, Cl. 355-4.000.

Kondo, Hiroo, to Nitto Seiko Co., Ltd. Head for a power operated screwdriver. 4,204,439, Cl. 81-57.370.

Kondo, Tatuya: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takai, Kiyoshi; and Kondo, Tatuya, 4,205,054, Cl. 423-390.000.

Kondo, Toshio: *See*—
Harada, Susumu; Kondo, Toshio; and Eino, Tomomi, 4,204,483, Cl. 123-32.0EL.

Kondratovsky, Viktor S.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Harada, Yoshiaki, 4,204,766, Cl. 356-404.000.
Yamada, Minoru; and Nakagawa, Yasutsugu, 4,204,759, Cl. 354-152.000.

Kononov, Ivan V.; Makushin, Mikhail P.; Maslennikov, Ivan E.; Platonov, Vladimir N.; and Silantiev, Igor I. Pulsator for hydraulic systems controlling actuating mechanisms. 4,204,458, Cl. 91-429.000.

Kool, Bram; Warszawski, Janusz; and Moritz, Jules G., to Microform Data Systems, Inc. Rotary film strip holding apparatus. 4,204,753, Cl. 353-26.00R.

Korklan, Harris J.; and Greany, John K., to Carborundum Company, The. Conditioned colloidal silica post impregnant to prevent binder migration. 4,204,907, Cl. 162-135.000.

Korolkov, Konstantin I.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V., 4,204,910, Cl. 176-30.000.

Koshiishi, Kiyozo: *See*—
Yamamoto, Tadao; Takekawa, Hiroshi; Banno, Taichi; and Koshiishi, Kiyozo, 4,204,917, Cl. 204-1.00T.

Koshinaka, Eiichi: *See*—
Kato, Hideo; and Koshinaka, Eiichi, 4,205,074, Cl. 424-267.000.

Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V. Gripping means for refuelling a nuclear reactor. 4,204,910, Cl. 176-30.000.

Kostjuk, Sergei F.: *See*—
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

Kostner, Karl; and Lufi, Aldo. Gum mask. 4,204,324, Cl. 433-299.000.

Kosuga, Tadashi: *See*—
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,353, Cl. 360-61.000.

Kottmann, Alfred: *See*—
Bergmann, Ewald; and Kottmann, Alfred, 4,204,380, Cl. 53-520.000.

Kouno, Akiyoshi; Morishita, Masanobu; and Yui, Yoshio, to Nippon Electric Co., Ltd. Circuit for making a CRT display a TV picture for a copy with dots superposed on half-tone picture areas. 4,205,340, Cl. 358-130.000.

Kovach, Alan J.: *See*—
Iannadrea, Gerald; Gorgone, Robert L.; and Kovach, Alan J., 4,204,765, Cl. 356-71.000.

Kovacs, Gabor: *See*—
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.

Koyama, Mitsuo: *See*—
Nakagawa, Tadashi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,204,763, Cl. 354-267.000.

Kozima, Hiroshi: *See*—
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,205,019, Cl. 525-243.000.

Kozuka, Mikio, to Asahi Glass Company, Limited. Spraying apparatus for preparing glass fiber reinforced cementitious product. 4,204,644, Cl. 239-220.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, 4,204,974, Cl. 252-301.10W.

Kramer, Justin. Music director system. 4,205,354, Cl. 360-72.100.

Krause, Anthony V.: *See*—
Sinclair, Clive M.; and Krause, Anthony V., 4,205,252, Cl. 313-422.000.

Kreuzburg, Eberhard; Eichholz, Gunter; and Dederichs, Knut, to Gesellschaft zur Errichtung von Unweltschutzanlagen mbH. Apparatus for the treatment and composting of biological waste. 4,204,959, Cl. 210-195.100.

Kreuzman, Harry E. Tennis practice serving net. 4,204,679, Cl. 273-29.00A.

Krill, Wayne V.: *See*—
Kendall, Robert M.; Kesselring, John P.; and Krill, Wayne V., 4,204,829, Cl. 431-7.000.

Krobel: *See*—
Bauer, Walter; Krobel; and Farber, 4,204,724, Cl. 354-281.000.

Kroger, Carl; Romey, Ingo; and Kolling, Georg, to Bergwerksverband GmbH. Coal-containing shaped bodies and process for making the same. 4,205,035, Cl. 264-120.000.

Krolak, Ronald F., to Bunker Ramo Corporation. Connector coupling ring retainer apparatus and electrical connector assembly retaining means. 4,204,740, Cl. 339-90.00R.

Krumpelt, Michael: *See*—
Britton, Wayne E.; and Krumpelt, Michael, 4,204,921, Cl. 204-98.000.

Krupke, William F.: *See*—
George, Victor E.; Haas, Roger A.; Krupke, William F.; and Schlitt, Leland G., 4,205,278, Cl. 331-94.50P.

Kryschuk, John J.: *See*—
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., 4,205,186, Cl. 568-600.000.

Kubo, Tadayuki: *See*—
Harada, Toshiro; Kubo, Tadayuki; Kasuya, Kazusato; and Watanabe, Yukihiro, 4,204,482, Cl. 123-32.0EE.

Kubota, Ltd.: *See*—
Nakagawa, Itsusuke; and Aoyama, Tokuichi, 4,204,486, Cl. 123-41.600.

Kuehnle, Manfred R.; Martinez, Ferdinand; and Ignasiak, Stanley F., to Coulter Systems Corporation. Direct-imaging flexible offset printing plate and method of manufacture. 4,204,865, Cl. 430-30.000.

Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, to AGFA-Gevaert, A.G. Process for the production of color photographic images using new white coupler substances. 4,204,867, Cl. 430-376.000.

Kuhn, Jacques, to Heinrich Kuhn Metallwarenfabrik Aktiengesellschaft. Cooking, serving and warm-keeping arrangement. 4,204,609, Cl. 220-408.000.

Kuhn, Lawrence: *See*—
DiStefano, Thomas H.; and Kuhn, Lawrence, 4,204,725, Cl. 355-3.00R.

Kuhne, Manfred: *See*—
Aufderhaar, Ernst; Gallay, Jean J.; Kuhne, Manfred; Meyer, Alfred; Rechsteiner, Oswald; Schellenbaum, Max; and Fumeaux, Jean-Paul, 4,205,077, Cl. 424-273.00B.

Kulakov, Valery M.: *See*—
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

Kumagai, Morio, to Trio Kabushiki Kaisha. Phase-locked loop circuit for use in synthesizer tuner and synthesizer tuner incorporating same. 4,205,272, Cl. 455-83.000.

Kunz, Adolf, to Wiegand Karlsruhe GmbH. Steam jet refrigeration plant. 4,204,410, Cl. 62-500.000.

Kurata, Kenzi; Fukumoto, Toshito; Yoshida, Yuji; Kusama, Masanori; and Tsuruta, Shintaro, to Mitsui Petrochemical Industries, Ltd. Process for azeotropic distillation. 4,204,915, Cl. 203-2.000.

Kurdowski, Wieslaw: *See*—
Nowak, Edmund; Zamojdo, Rudolf; Parda, Andrzej; Kurdowski, Wieslaw; and Jankowski, Stefan, 4,204,836, Cl. 432-58.000.

Kuroda, Mototsugu: *See*—
Yasunaga, Ryuichi; Tsutsumi, Shinya; and Kuroda, Mototsugu, 4,204,297, Cl. 15-323.000.

Kuroyanagi, Tomomitsu: *See*—
Nakagawa, Isao; Nabeyama, Hiroaki; and Kuroyanagi, Tomomitsu, 4,205,335, Cl. 358-31.000.

Kurtz, Bruce E.; and Fitch, Robert H., to Allied Chemical Corporation. Electrolytic production of chlorine and caustic soda. 4,204,920, Cl. 204-98.000.

Kurtz, John J.: *See*—
Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; and Kurtz, John J., 4,205,200, Cl. 370-83.000.

Kurz, Karl H. Sound for insertion in the body for the determination of the internal measurements of hollow organs. 4,204,548, Cl. 128-778.000.

Kusama, Masanori: *See*—
Kurata, Kenzi; Fukumoto, Toshito; Yoshida, Yuji; Kusama, Masanori; and Tsuruta, Shintaro, 4,204,915, Cl. 203-2.000.

Kushida, Shozo: *See*—
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,204,395, Cl. 368-35.000.

Kutaragi, Ken, to Sony Corporation. Liquid crystal display device. 4,205,311, Cl. 340-784.000.

Kutner, Barry S. Variable diameter aspirating tip. 4,204,328, Cl. 433-29.000.

Kutzner, Willi A. P.; and Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Wire stapling apparatus. 4,204,626, Cl. 227-81.000.

Kutzner, Willi A. P.; and Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Staple closing mechanism. 4,204,627, Cl. 227-81.000.

Kuznetsova, Tamara V.: *See*—
Nudelman, Boris I.; Bikbau, Marsel Y.; Oborin, Pavel A.; and Kuznetsova, Tamara V., 4,204,878, Cl. 106-104.000.

Kyowa Electric & Chemical Co., Ltd.: *See*—
Hirota, Kashichi, 4,204,617, Cl. 224-45.00A.

Kyung, Jai H.; and Richards, Harvey J., to Sherex Chemical Company, Inc. Liquid-liquid extraction of Cu, Co, Ni from ammoniacal solutions with 7-ethyl-undeca-2,4-dione. 4,205,048, Cl. 423-24.000.

L. Schuler GmbH: *See*—
Bergmann, Ewald; and Kottmann, Alfred, 4,204,380, Cl. 53-520.000.

Ladage, Cornelis A.; van Linge, Douwe J.; and van Riessen, Huibert A., to ACF Chemiefarma N.V. Solvent vehicle for the parenteral administration of therapeutics. 4,205,089, Cl. 424-365.000.

Lancaster, Patrick R.: *See*—
Lancaster, William G.; and Lancaster, Patrick R., 4,204,377, Cl. 53-399.000.

Lancaster, William G.; and Lancaster, Patrick R., to Lantech, Inc. Process and apparatus for wrapping netting material around a load. 4,204,377, Cl. 53-399.000.

Lancelot, Harry B., III; and Macrobbie, Robert M., to Brown Company. Coupling for lift system for concrete slabs. 4,204,711, Cl. 294-89.000.

Land, Elvert H., Jr.; and Land, Joseph E. Method and device for inserting a rigid liner in a helmet shell. 4,204,311, Cl. 29-451.000.

Land, Joseph E.: *See*—
Land, Elvert H., Jr.; and Land, Joseph E., 4,204,311, Cl. 29-451.000.

Lane, Manning; Hauck, Warren J.; and Sweeney, Roy O. Knock-down sofa bed with hinged mattress. 4,204,287, Cl. 5-18.00R.

Langton, Frederick H.: *See*—
Salway-Waller, Malcolm; and Langton, Frederick H., 4,205,210, Cl. 219-10.810.

Langworthy, Harold F.: *See*—
Horak, Jerry R.; Langworthy, Harold F.; Rauner, Frederick J.; and Gross, Robert C., 4,204,866, Cl. 430-306.000.

Lantech, Inc.: *See*—
Lancaster, William G.; and Lancaster, Patrick R., 4,204,377, Cl. 53-399.000.

Laptev, Fedor V.: *See*—
Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V., 4,204,910, Cl. 176-30.000.

Larbalestier, David C.: *See*—
Young, Morris S.; and Larbalestier, David C., 4,205,119, Cl. 428-614.000.

Lare, Donald W.: *See*—
Hart, John R.; Lare, Donald W.; and Nault, James J., 4,205,025, Cl. 264-14.000.

Larson, Clayton E., to White Metal Rolling and Stamping Corp. Ladder constructions. 4,204,587, Cl. 182-228.000.

Laser File Inc.: *See*—
Schaefer, Louis F., 4,205,338, Cl. 358-28.500.

Lassig, Wolfgang: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, 4,204,867, Cl. 430-376.000.

Latham, Allen, Jr., to Haemonetics Corporation. Process for pheresis procedure and disposable plasma. 4,204,537, Cl. 128-214.00R.

Laude, Jean-Pierre, to Instruments S.A. Process of coding a card with a diffraction grating having lines with irregular spacing. 4,204,638, Cl. 235-454.000.

Laughton, Malcolm; and Robinson, Sidney H., to Laughton & Sons Limited. Index-selector devices. 4,204,352, Cl. 40-389.000.

Laughton & Sons Limited: *See*—
Laughton, Malcolm; and Robinson, Sidney H., 4,204,352, Cl. 40-389.000.

Laurent, Michel: *See*—
Hubert, Francois; Laurent, Michel; and Leger, Lucien, 4,204,721, Cl. 316-19.000.

Lautenbach, Dieter: *See*—
Barzynski, Helmut; Hartmann, Heinrich; Lautenbach, Dieter; Osterloh, Rolf; Goethlich, Lutz; and Heil, Guenter, 4,205,139, Cl. 525-38.000.

Lava Gardens, Inc.: *See*—
Dunn, Burton D., 4,204,599, Cl. 206-575.000.

La Via, Anthony L.: *See*—
Cilento, Rudolfo D.; La Via, Anthony L.; Chen, James L.; and Hill, John A., 4,204,540, Cl. 128-283.000.

Lavon, Erik V., to Atlas Copco Aktiebolag. Method and device for breaking a hard compact material. 4,204,715, Cl. 299-16.000.

Lazzari, Jean-Pierre; and Helle, Michel, to Compagnie Internationale pour l'Informatique. Method of producing a magnetic transducer device. 4,204,315, Cl. 29-603.000.

Le Carbone-Lorraine: *See*—
Maire, Jacques; Fourre, Jacques; and Gervais, Jean P., 4,205,055, Cl. 423-445.000.

Leach, John M. Article accumulation conveyor. 4,204,593, Cl. 198-781.000.

Lear Siegler, Inc.: *See*—
Eriksen, Harald S., 4,204,560, Cl. 137-508.000.

Leary, Dennis J. Limb and/or body restraint. 4,204,534, Cl. 128-134.000.

Leblanc, Bernard: *See*—
Forestier, Jean; Leblanc, Bernard; Monteil, Marcel; and Monteil, Pierre, 4,204,502, Cl. 122-32.000.

Le Blanc, Joseph A., to Gast Manufacturing Corporation. Cartridge rotary vane pump. 4,204,815, Cl. 418-13.000.

Leclerc, Pierre: *See*—
Micheron, Francois; Bruneel, Jean L.; and Leclerc, Pierre, 4,205,242, Cl. 307-400.000.

Lee, Ching W.: *See*—
Dempsey, Martin E.; and Lee, Ching W., 4,205,285, Cl. 333-194.000.

Lee, James C. C. Teletypewriter. 4,204,776, Cl. 400-119.000.

Lee, Richard J.; and Harris, Samuel W., to Standard Oil Company (Indiana). Lubricant compositions containing alkylated aromatic amino acid antioxidants. 4,204,970, Cl. 252-51.50A.

Lee, Sen L.; Shah, Franklin B.; and Jamieson, John W., to Qume Corporation. High character capacity impact printer. 4,204,779, Cl. 400-144.200.

Lefever, Joseph D.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefever, Joseph D., 4,204,918, Cl. 204-24.000.

Lefrancois, Jean, to Compagnie Generale des Etablissements Michelin. Process of fabricating hollow bead rings. 4,204,309, Cl. 29-412.000.

Leger, Donald R.; Clifford, Peter P.; and Matson, William N., to General Electric Company. Diaphragm support. 4,204,803, Cl. 415-219.00R.

Leger, Lucien: *See*—
Hubert, Francois; Laurent, Michel; and Leger, Lucien, 4,204,721, Cl. 316-19.000.

LeGoff, Denis, to Compagnie Generale d'Electricite. Method of generating an electric pulse of predetermined shape and application to cutting out a portion from a laser pulse. 4,205,225, Cl. 250-229.000.

Le Guelennec, Emile, to Machines et Applications. Shear for large-sized scrap. 4,204,450, Cl. 83-461.000.

Lemaire, Pierre H. Device for handling containers. 4,204,793, Cl. 414-421.000.

Lemelson, Jerome H. Method and means for automatically setting timepieces in a time zone. 4,204,398, Cl. 36 58-47.000.

Lemke, Paul A.: *See*—
Maul, Stephen B.; Lemke, Paul A.; Gerner, Walter L.; and Yoder, John B., 4,204,364, Cl. 47-1.100.

Lersmacher, Bernhard; Lydtin, Hans; Schelhas, Karlheinz; and Knippenberg, Wilhelmus F., to U.S. Philips Corporation. Cuvette for flameless atom absorption spectroscopy. 4,204,769, Cl. 356-244.000.

Lester, Frank R.; and Bullard, James, to Nuvite Chemical Compounds Corporation. Portable scrubbing tool. 4,204,292, Cl. 15-28.000.

Lever, Robert C., to Volstatic Holding Limited. Electrostatic coating apparatus having conveyor belt, fluidizing and electrostatic means for recirculation of coating particles. 4,204,497, Cl. 118-634.000.

Levering, Arie W.: *See*—
Akzo N.V.; and Levering, Arie W., 4,205,102, Cl. 427-393.500.

Levi Strauss & Co.: *See*—
Blessing, Hubert, 4,204,492, Cl. 112-121.290.

Levichev, Pavel A.: *See*—
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.

Le Viet, Toai, to Societe d'Assistance Technique pour Produits Nestle S.A. Microwave freeze drying method and apparatus. 4,204,336, Cl. 34-5.000.

Levy, Edward D.: *See*—
Grossman, Morris G.; Levy, Edward D.; and Meisner, Edward H., 4,204,335, Cl. 33-476.000.

Lewis, Gilbert W.: *See*—
Feldstein, Cyril; Lewis, Gilbert W.; and Culler, Virgil H., 4,204,544, Cl. 128-642.000.

Leyva, Rodolfo M.; and Allison, James E., Jr. Newt sanctuary. 4,204,499, Cl. 119-5.000.

Lichtenberg, Heinz D., to Dresser Industries, Inc. Method and apparatus to determine the proximity of a permanent magnet using a magnetometer. 4,205,266, Cl. 324-253.000.

Lieb, Erwin: *See*—
Wiest, Hubert; Ludwig, Peter; Hafener, Klaus; and Lieb, Erwin, 4,205,161, Cl. 528-487.000.

Liebig, Lothar; Wingler, Frank; Margotte, Dieter; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions. 4,205,140, Cl. 525-67.000.

Liebig, Lothar; Wingler, Frank; Humme, Gert; and Prinz, Richard, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions. 4,205,141, Cl. 525-67.000.

Liermann, Peter; and Weise, Lutz, to WABCO Westinghouse GmbH. Device for monitoring the function of electromagnets. 4,205,307, Cl. 340-644.000.

Ligon, Woodfin V.: *See—*
Webb, Jimmy L.; and Ligon, Woodfin V., 4,204,428, Cl. 73-339.00R.

Ligorati, Ferdinando: *See—*
Invernizzi, Renzo; Ligorati, Ferdinando; and Fontanesi, Maurizio, 4,204,981, Cl. 252-429.00B.

Lillig, John E.: *See—*
Sternberg, James C.; and Lillig, John E., 4,204,837, Cl. 23-230.00B.

Lin, Kou C.; Ellis, Belvin B.; and Burkhardt, Charles E., to Westinghouse Electric Corp. Transformer with parallel magnetic circuits of unequal mean lengths and loss characteristics. 4,205,288, Cl. 336-5.000.

Lincicome, Thomas N.; Spiro, John M.; and Brons, Albert J., to UOP Inc. Vibration absorbing connector. 4,204,707, Cl. 285-114.000.

Lind, Herbert C.; Rumore, Peter J.; and Wysocki, Tadeusz S., to Dexter Corporation, The. Non-skid fenestration material. 4,204,532, Cl. 128-132.00D.

Lindenberger, Charles J.: *See—*
Johnson, John N.; and Lindenberger, Charles J., 4,204,322, Cl. 433-185.000.

Linfield, Wayne S., to United States of America, Navy. Elevation simulation for frequency scan three dimensional radar. 4,204,342, Cl. 35-10.400.

Lingaya, Stenio, to Siemens Aktiengesellschaft. Synchronous linear motor. 4,205,243, Cl. 310-13.000.

Litton Industrial Products, Inc.: *See—*
Cribbs, Robert W.; and Mahony, John E., 4,204,433, Cl. 73-620.000.

Liu, Hsin. Method of separating fusible plastics from solid waste. 4,204,906, Cl. 162-6.000.

Liu, Wen C.: *See—*
Sykes, Richard B.; Wells, J. Scott; Principe, Pacifico A.; and Liu, Wen C., 4,205,068, Cl. 424-117.000.

Lo, Grace Y-S.: *See—*
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,205,016, Cl. 260-665.00R.

Loane, Charles M., Jr.; and Hoss, Martin L., to SCM Corporation. Particulate slagging composition for the continuous casting of steel. 4,204,864, Cl. 75-257.000.

Lobdell, Donn D.; Herman, Stephen J.; and Giurtino, Joel F., to Cobe Laboratories, Inc. Blood oxygenator with a gas filter. 4,205,042, Cl. 422-47.000.

Lockshin, Robert E. Louvered window shade device. 4,204,368, Cl. 49-67.000.

Loeb, Phillip J.: *See—*
Smith, Leland B.; and Loeb, Phillip J., 4,204,546, Cl. 128-731.000.

Lofstedt, Ingemar G.: *See—*
Wicksell, Hans A.; Stahl, Stig; and Lofstedt, Ingemar G., 4,204,693, Cl. 280-809.00T.

Loker, W. Aleck; Bortzfield, Jon L.; Chard, Steven D.; Hall, John W.; and Meredith, John T., to United States of America, Navy. Shaft decoupling device. 4,204,589, Cl. 192-27.000.

Long, James F.: *See—*
Sherlock, Margaret H.; and Long, James F., 4,205,073, Cl. 424-266.000.

Lonza, Ltd.: *See—*
Michel, Urs, 4,205,174, Cl. 546-249.000.

Lord Corporation: *See—*
Koeneman, James B., 4,204,284, Cl. 3-1.910.

Loughran, James A.: *See—*
Houston, Douglas E.; and Loughran, James A., 4,204,628, Cl. 228-106.000.

Lovasz nee Gaspar, Marianna: *See—*
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.

Lucan, Andre: *See—*
Morizot, Henri; and Lucan, Andre, 4,205,120, Cl. 428-676.000.

Lucas Industries Limited: *See—*
Ward, Peter J., 4,205,378, Cl. 364-431.000.

Lucas-Milhaupt, Inc.: *See—*
Fischer, Jerome A., 4,204,597, Cl. 206-216.000.

Luciani, Sandro: *See—*
Conti, Mario; Chiavarotti, Gian P.; and Luciani, Sandro, 4,205,332, Cl. 357-34.000.

Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., to United States of America, Agriculture. Physiochemically designed fat compositions from tallow and process for making. 4,205,006, Cl. 260-410.700.

Ludwig, George C., to Tom McGuane Industries, Inc. Fuel pressure regulator assembly. 4,204,561, Cl. 137-510.000.

Ludwig, Peter: *See—*
Wiest, Hubert; Ludwig, Peter; Hafener, Klaus; and Lieb, Erwin, 4,205,161, Cl. 528-487.000.

Lufi, Aldo: *See—*
Kostner, Karl; and Lufi, Aldo, 4,204,324, Cl. 433-299.000.

Luiz, Fernando A.: *See—*
Bardsley, Henry, III; Luiz, Fernando A.; Nilsen, Nils F.; and Simpson, Ronald C., 4,205,374, Cl. 364-200.000.

Lumoprint Zindler KG (GmbH & Co.): *See—*
Opravil, Egon, 4,204,735, Cl. 355-75.000.

Luthi, Walter, to Heberelein Maschinenfabrik AG. Device relating to apparatus for texturing textile yarns. 4,204,394, Cl. 57-334.000.

Lutz, Andre: *See—*
Vignau, Michel; and Lutz, Andre, 4,205,072, Cl. 424-246.000.

Lutz, David E.: *See—*
Lutz, David W.; and Lutz, David E., 4,204,592, Cl. 198-750.000.

Lutz, David W.; and Lutz, David E. Loading and unloading apparatus for vehicles. 4,204,592, Cl. 198-750.000.

Lyashenko, Jury P.: *See—*
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.

Lydie, Phillip E. C. Ripper attachment for earth-working equipment. 4,204,348, Cl. 37-117.500.

Lydtin, Hans: *See—*
Lersmacher, Bernhard; Lydtin, Hans; Schelhas, Karlheinz; and Knippenberg, Wilhelmus F., 4,204,769, Cl. 356-244.000.

Lysov, Valery B.: *See—*
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

M. Hamburger & Sons, Inc.: *See—*
Bowden, Alan P., 4,204,876, Cl. 106-90.000.

M & R Seal Press Co., Inc.: *See—*
Harrison, Paul H., 4,204,468, Cl. 101-3.0SP.

Machines et Applications: *See—*
Le Guelennec, Emile, 4,204,450, Cl. 83-461.000.

Mack, Jack E.; and Mack, Patrick K., to CLM International Corp. Lubricant additive. 4,204,968, Cl. 252-26.000.

Mack, Patrick K.: *See—*
Mack, Jack E.; and Mack, Patrick K., 4,204,968, Cl. 252-26.000.

Macrobbie, Robert M.: *See—*
Lancelot, Harry B., III; and Macrobbie, Robert M., 4,204,711, Cl. 294-89.000.

Maeda, Masahiro; and Kayahara, Hirohumi, to Minolta Camera Kabushiki Kaisha. Focus adjusting mechanism for variable magnification device. 4,204,732, Cl. 355-55.000.

Maeda, Toshinobu; Nakamura, Yoshikazu; and Kawazoe, Akio, to Matsushita Electric Industrial Co., Ltd.; and Oki Electric Industry Co., Ltd. Motor control system. 4,205,260, Cl. 318-318.000.

Maekawa, Junji: *See—*
Izumi, Yusuke; Maekawa, Junji; and Suzuki, Katsumi, 4,205,182, Cl. 560-247.000.

Magnat Corp.: *See—*
Mengel, William R., 4,204,650, Cl. 242-56.00R.

Mahieu, William R. High continuous current capacity oil expulsion fuse. 4,205,295, Cl. 337-250.000.

Mahony, John E.: *See—*
Cribbs, Robert W.; and Mahony, John E., 4,204,433, Cl. 73-620.000.

Maire, Jacques; Fourre, Jacques; and Gervais, Jean P., to Le Carbone-Lorraine. Dual pore-structure artificial carbon and graphite. 4,205,055, Cl. 423-445.000.

Maixner, Uwe; and Milferstadt, Dieter, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Arrangement for preventing the alteration of the primary beam by unwanted particles, such as sputter products, charged ions and electrons and their secondary processes. 4,205,232, Cl. 250-397.000.

Makino, Shigeo: *See—*
Takase, Koyu; Makino, Shigeo; and Naitou, Tadashi, 4,204,691, Cl. 277-235.00B.

Makovec, Donald J.; and Haskell, Donald M., to Phillips Petroleum Company. Acid-type hydrocarbon alkylation with acid recycle streams at spaced points of a vertically-disposed elongated reactor. 4,205,196, Cl. 585-701.000.

Makuch, John A., to Bunker Ramo Corporation. Apparatus for aligning and terminating an optical fiber within a fiber optic connector. 4,204,306, Cl. 29-281.500.

Makushin, Mikhail P.: *See—*
Kononov, Ivan V.; Makushin, Mikhail P.; Maslennikov, Ivan E.; Platonov, Vladimir N.; and Silantiev, Igor I., 4,204,458, Cl. 91-429.000.

Malec, Robert E., to Ethyl Corporation. Anti-wear additives in diesel fuels. 4,204,481, Cl. 123-1.00A.

Mallick, George T., Jr., to Westinghouse Electric Corp. Method of testing induction motors. 4,204,425, Cl. 73-116.000.

Mandai, Masaaki: *See—*
Asano, Kazuhiro; Ueda, Makoto; Torisawa, Akira; Shida, Masaharu; Satoh, Katsuhiko; and Mandai, Masaaki, 4,204,397, Cl. 368-202.000.

Mandon, Jean-Pierre: *See—*
Hennart, Claude; Rabussier, Bernard; Mandon, Jean-Pierre; and Sapin, Joel, 4,205,066, Cl. 424-84.000.

Mannesmann Aktiengesellschaft: *See—*
Schwitzgobel, Rudolf; and Monreal, Karl, 4,204,880, Cl. 134-32.000.

Manning Environmental Corp.: *See—*
Fleenor, Richard P., 4,205,315, Cl. 343-14.000.

Marchal, Paul: *See—*
Doucin, Guy; and Marchal, Paul, 4,204,340, Cl. 34-225.000.

Margotte, Dieter: *See—*
Liebig, Lothar; Wingler, Frank; Margotte, Dieter; and Nouvertne, Werner, 4,205,140, Cl. 525-67.000.

Maricic, Alexander, to John Lysaght (Australia) Limited. Vehicle decking bearer. 4,204,712, Cl. 296-35.100.

Marion Plywood Corporation: *See—*
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,420, Cl. 72-439.000.
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,421, Cl. 72-439.000.

Marling, Douglas S. Screw extracting device. 4,204,308, Cl. 29-426.500.

Marrs, Clinton E., to Amax Inc. Adjustable conveyor belt skirtboard. 4,204,595, Cl. 198-836.000.

Martel, Jacques; and Tessier, Jean, to Roussel Uclaf. Optically active sulfonates of allethrolone. 4,205,008, Cl. 260-456.00R.

Martin, Jerry R.: *See—*
Tadanier, John S.; Dunnigan, Daniel A.; Freiberg, Leslie A.; and Martin, Jerry R., 4,205,070, Cl. 424-180.000.

Martin, Peter J.; and Jaron, Dov. Method and apparatus for controlling cardiac assist device. 4,204,524, Cl. 128-1.00D.

Martinez, Ferdinand: *See—*
Kuehnle, Manfred R.; Martinez, Ferdinand; and Ignasiak, Stanley F., 4,204,865, Cl. 430-30.000.

Marubashi, Kiyonobu, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermo-reversible elastomer composition comprising a liquid chloroprene polymer and a polyvalent metal oxide or hydroxide. 4,205,150, Cl. 526-252.000.

Marvin Glass & Associates: *See—*
Terzian, Rouben T.; Montague, Douglas P.; and Morrison, Howard J., 4,204,613, Cl. 222-146.00C.

Masaki, Asanori: *See—*
Minezaki, Hisao; Haneda, Akio; Masaki, Asanori; Hanzawa, Takeo; and Uchiike, Yukio, 4,204,648, Cl. 242-18.00A.

Maschinenbau Oppenweiler GmbH: *See—*
Klenk, Emil, 4,204,667, Cl. 271-3.100.

Maschinenfabrik Rau oHG: *See—*
Rau, Willy; and Taus, Christian, 4,204,579, Cl. 172-657.000.

Mashio, Tasuku: *See—*
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,205,117, Cl. 428-411.000.

Maslennikov, Ivan E.: *See—*
Kononov, Ivan V.; Makushin, Mikhail P.; Maslennikov, Ivan E.; Platonov, Vladimir N.; and Silantiev, Igor I., 4,204,458, Cl. 91-429.000.

Maslov, Anatoly R.: *See—*
Ulyanov, Gennady P.; and Maslov, Anatoly R., 4,205,391, Cl. 364-900.000.

Massachusetts General Hospital, The: *See—*
Podolsky, Daniel K.; and Weiser, Milton M., 4,205,129, Cl. 435-193.000.

Massey-Ferguson Services N.V.: *See—*
Quick, Donald J., 4,204,491, Cl. 111-3.000.

Massey, John P. Squaring device for storage of rods, tubes, and like articles. 4,204,788, Cl. 414-21.000.

Masuda, Senichi: *See—*
Yamamoto, Masahiro; Okamoto, Yasunari; Itoh, Tsutomu; and Masuda, Senichi, 4,205,359, Cl. 361-58.000.

Masumoto, Hakaru; and Sawaya, Showhachi, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. High damping capacity alloy. 4,204,887, Cl. 148-31.000.

Masumoto, Hakaru; and Sawaya, Showhachi, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. High damping capacity alloy. 4,204,888, Cl. 148-31.000.

Mathews, Carl F.: *See—*
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,205,020, Cl. 325-275.000.

Matisa Materiel Industriel S.A.: *See—*
Cicin-Sain, Ivo, 4,204,476, Cl. 104-2.000.

Matrosov, Evgeny A.: *See—*
Shikhirev, Boris N.; Matrosov, Evgeny A.; and Deresh, Ilya A., 4,204,370, Cl. 51-80.00A.

Matson, William N.: *See—*
Leger, Donald R.; Clifford, Peter P.; and Matson, William N., 4,204,803, Cl. 415-219.00R.

Matsugo, Ryuzo, to Sumiyoshi Denki Kabushiki Kaisha. Noise rejecting compensation circuit for developing apparatus. 4,204,764, Cl. 354-298.000.

Matsumoto, Akiyoshi: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, 4,205,127, Cl. 435-179.000.

Matsumoto, Tateo: *See—*
Sakurai, Kiyoshi; Matsumoto, Tateo; and Ishikawa, Teruo, 4,205,390, Cl. 364-900.000.

Matsumura, Isao: *See—*
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,205,347, Cl. 358-191.100.

Matsumura, Ko: *See—*
Irie, Toshio; Matsumura, Ko; Nakamura, Hiroto; Shimanaka, Hiroshi; and Suzuki, Toshio, 4,204,890, Cl. 148-111.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Komeda, Tadao; and Ogawa, Kazufumi, 4,204,894, Cl. 148-188.000.
Maeda, Toshinobu; Nakamura, Yoshikazu; and Kawazoe, Akio, 4,205,260, Cl. 318-318.000.
Naitoh, Yasuo, 4,205,121, Cl. 429-99.000.

Matsushita, Yoshihiro: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,205,180, Cl. 560-168.000.

Matsuzaki, Tokuo: *See—*
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,205,010, Cl. 260-465.300.

Mattick, Leonard R.; and Gogel, Edward V., to Cornell Research Foundation, Inc. Acid reduction in wine by ion exchange. 4,205,092, Cl. 426-271.000.

Mattson, John P., to Solarspan, Inc. Solar energy tracking collector. 4,204,521, Cl. 126-446.000.

Matzen, Max, to Klockner-Humboldt-Deutz Aktiengesellschaft. Fuel injection pump with roller shaft for internal combustion engines. 4,204,814, Cl. 417-437.000.

Maubois, Jean-Louis J.; Mocquot, Germain P. C. B.; and Vassal, Louis J., to Etablissement Public: Institut National de la Recherche Agronomique. Preparation of cheese using ultrafiltration. 4,205,090, Cl. 426-40.000.

Maul, Stephen B.; Lemke, Paul A.; Gerner, Walter L.; and Yoder, John B., to Butler County Mushroom Farm, Inc. Method and apparatus for sterile cultivation of cells on solid substrates. 4,204,364, Cl. 47-1.100.

Maule, James: *See—*
Bridwell, Glenn D.; Maule, James; Schrombeck, Alois; and Wognum, Willis, 4,204,494, Cl. 114-222.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Johnson, Mark; and Ulrich, Reinhard, 4,204,742, Cl. 350-96.200.

Mazur, Robert H.: *See—*
Hallinan, E. Ann; and Mazur, Robert H., 4,204,991, Cl. 260-112.50R.

McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Isolation of hepatitis B e antigen. 4,204,989, Cl. 260-112.00B.

McAlister, M. Khristian: *See—*
Baughn, William E.; Williams, Kenneth R.; and McAlister, M. Khristian, 4,204,663, Cl. 254-88.000.

McCarthy, Robert F., to Procter & Gamble Company, The. Fitment for rendering a container child-resistant. 4,204,615, Cl. 222-153.000.

McCauley, Jon R.: *See—*
Kirrish, Hail; and McCauley, Jon R., 4,204,566, Cl. 151-38.000.

McCrary, Avis L.: *See—*
Wilson, David A.; and McCrary, Avis L., 4,205,065, Cl. 424-81.000.

McCray, David M.; and Murray, Gerald D., to Kennametal Inc. Milling cutter. 4,204,787, Cl. 409-234.000.

McFarlane, James D.: *See—*
Patton, Franklin D.; and McFarlane, James D., 4,204,426, Cl. 73-151.000.

McGinnis, Gerald E., to Monicor Corp. Air chamber leg exercising device. 4,204,675, Cl. 272-130.000.

McGinniss, Vincent D.; and Stevenson, Donald R., to SCM Corporation. Process for electrodeposition of compositions containing carbamothioate curing agents. 4,204,932, Cl. 204-181.00R.

McGrath, N. Christian: *See—*
Jones, Leith; and McGrath, N. Christian, 4,205,099, Cl. 427-90.000.

McGregor, Stanley D.: *See—*
Wang, Chun S.; McGregor, Stanley D.; and Nestrick, Terry J., 4,205,015, Cl. 260-651.00R.

McGregor, William H.: *See—*
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Maeda, Masahiro; and Kayahara, Hirohumi, 4,204,732, Cl. 355-55.000.
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Mizelle, William R. Caloric incapacitating low-lethality projectile. 4,204,474, Cl. 102-92.700.
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Monsimer, Harold G.; and Bohm, Howard A., to Pennwalt Corporation. Microcapsules containing medicament-polymer salt having a water-insoluble polymer sheath, their production and their use. 4,205,060, Cl. 424-14.000.
Montague, Douglas P.: *See*—
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Moore, Stanley E., to General Electric Company. Two dimensional light beam selection system. 4,205,304, Cl. 340-365.00P.
Moorer, Howard H.; and Anderegg, Charles M., to Westvaco Corporation. Cement grinding aid and set retarder. 4,204,877, Cl. 106-90.000.
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Morel, Pierre; Ortega, Yasmine; Jullien, Claudette; and Jullien, Antonin. Process for converting biodegradable wastes into industrial gases. 4,204,842, Cl. 48-197.00A.
Morgan, Howard W., Jr., to Filter Specialists, Inc. Liquid filter and filter element. 4,204,966, Cl. 210-455.000.
Morgan, James P.: *See*—
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Mori, Shunro; Okamoto, Rokuro; Inui, Taiji; and Takeuchi, Tomio, to Sanraku-Ocean Co., Ltd. Tylosin derivatives. 4,205,163, Cl. 536-17.00R.
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Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,205,180, Cl. 560-168.000.
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Morita, Yoshinori; Inoue, Hiroshi; and Fujiyoshi, Kenji, to Mitsui Petrochemical Industries, Ltd. Ethylene copolymers. 4,205,021, Cl. 525-240.000.
Moritz, Alfred: *See*—
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Morizot, Henri; and Lucan, Andre, to Compagnie Internationale pour l'Informatique. Magnetic recording element. 4,205,120, Cl. 428-676.000.
Morohoshi, Fumio; and Hasegawa, Yoshio, to Kabushiki Kaisha Daini Seikosha. Electronic metronome. 4,204,400, Cl. 84-484.000.
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Morozov, Vasily P.: *See*—
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Morozowich, Walter, to Upjohn Company, The. Inter-phenylene-ω-aryl-PG amides. 4,205,011, Cl. 260-558.00R.
Morris, Richard L., to Outboard Marine Corporation. Combination ignition switch and fuel priming system. 4,204,511, Cl. 123-187.50R.
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Moser, Theo; Andra Rolf; Rittler, Roland; and Strampfer, Armin, to Robert Bosch GmbH. Apparatus for sorting capsules and the like. 4,204,951, Cl. 209-625.000.
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Gatto, Donald F., 4,204,608, Cl. 220-335.000.
Parish, Edward C., 4,205,286, Cl. 333-226.000.
Muench, Wayne C.; Hormel, Thad S.; Kirchhoff, Pamela M.; and Robbins, Lanny A., to Dow Chemical Company, The. Process for the production of hydroxybenzyl alcohols. 4,205,188, Cl. 568-764.000.
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Muller, Franz, to August Lepper, Maschinen-U. Apparatebau GmbH. Tumbler washing and drying machine. 4,204,339, Cl. 34-75.000.
Muller, Hanns P.; and Wagner, Kuno, to Bayer Aktiengesellschaft. Polyurethane foams and elastomers prepared from low molecular weight polyhydroxyl compounds. 4,205,138, Cl. 521-158.000.

Muller, Jorn: *See*—
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Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,205,117, Cl. 428-411.000.
Murib, Jawad H., to National Distillers and Chemical Corporation. Process for preparing unsaturated esters. 4,205,181, Cl. 560-241.000.
Murphy, Raymond J. Bearing and support. 4,204,719, Cl. 308-188.000.
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McCray, David M.; and Murray, Gerald D., 4,204,787, Cl. 409-234.000.
Music, John, to Documation Incorporated. Character generator. 4,205,309, Cl. 340-739.000.
Musolino, Joseph A.: *See*—
Ho, Eugene Y.; and Musolino, Joseph A., 4,205,300, Cl. 340-65.000.
Muuller, Rolf: *See*—
Ritter, Ernst; Schwartz, Reinhard; Muuller, Rolf; Sturm, Waldemar; and Faupel, Werner, 4,204,510, Cl. 123-179.00L.
Myers, Richard W.: *See*—
Gilchrist, Forbes D.; Miller, Robert L.; and Myers, Richard W., 4,205,280, Cl. 333-151.000.
Naarmann, Herbert; McKee, Graham E.; and Schmitt, Burghard, to BASF Aktiengesellschaft. Preparation of graft copolymers. 4,205,144, Cl. 525-273.000.
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Nakagawa, Isao; Nabeyama, Hiroaki; and Kuroyanagi, Tomomitsu, 4,205,335, Cl. 358-31.000.
Nagao, Tsukasa. Ferrite composite circulator. 4,205,281, Cl. 333-1.100.
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Nagler, Georg: *See*—
Hofmann, Otto; and Nagler, Georg, 4,204,635, Cl. 235-382.000.
Nagumo, Fumio, to Sony Corporation. Signal processing system. 4,205,336, Cl. 358-43.000.
Nagy, Julius S.: *See*—
Davis, Joseph P.; and Nagy, Julius S., 4,205,103, Cl. 427-373.000.
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Sugahara, Yujiro; Naito, Hiroyuki; Takai, Kiyoshi; and Kondo, Tatuya, 4,205,054, Cl. 423-390.000.
Naitoh, Yasuo, to Matsushita Electric Industrial Co., Ltd. Storage compartment. 4,205,121, Cl. 429-99.000.
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Nakada, Tatsuji. Burglar alarm. 4,205,305, Cl. 340-548.000.
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Nakagawa, Tadashi; Koyama, Mitsuo; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Exposure time setting device for shutter of camera. 4,204,763, Cl. 354-267.000.
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Yamada, Minoru; and Nakagawa, Yasutsugu, 4,204,759, Cl. 354-152.000.
Nakai, Kazuhiro: *See*—
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,205,347, Cl. 358-191.100.
Nakamura, Hiroto: *See*—
Irie, Toshio; Matsumura, Ko; Nakamura, Hiroto; Shimanaka, Hiroshi; and Suzuki, Toshio, 4,204,890, Cl. 148-111.000.
Nakamura, Joji: *See*—
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,205,019, Cl. 525-243.000.
Nakamura, Yasuo: *See*—
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Nakamura, Yoshikazu: *See*—
Maeda, Toshinobu; Nakamura, Yoshikazu; and Kawazoe, Akio, 4,205,260, Cl. 318-318.000.
Nakanishi, Hiromasa: *See*—
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,204,395, Cl. 368-35.000.
Nalley, David J., to Singer Company, The. Forward biased switch for a reversible hammer drill. 4,204,580, Cl. 173-48.000.
Nanjo, Hirotoshi; and Watanabe, Takeshi, to Kokusan Denki Co., Ltd. Current interruption type ignition system for an internal combustion engine. 4,204,509, Cl. 123-148.00E.
Narahara, Yoshiyasu: *See*—
Barton, Richard E.; Fultz, Jack V.; Narahara, Yoshiyasu; and Shebanow, Michael S., 4,205,357, Cl. 360-135.000.
Nartron Corporation: *See*—
Miller, Gerald K., 4,205,237, Cl. 307-118.000.
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Murib, Jawad H., 4,205,181, Cl. 560-241.000.
National Research Development Corporation: *See*—
Bellhouse, Brian J.; and Williams, William G., 4,204,283, Cl. 3-1.500.
Butterfield, Roy, 4,205,362, Cl. 361-234.000.
National Semiconductor Corporation: *See*—
Klein, Thomas, 4,205,330, Cl. 357-23.000.
Wright, John W.; and Gross, William H., 4,205,276, Cl. 330-294.000.
Nault, James J.: *See*—
Hart, John R.; Lare, Donald W.; and Nault, James J., 4,205,025, Cl. 264-14.000.
NCR Corporation: *See*—
Jen, Tai-Kuang, 4,204,777, Cl. 400-124.000.
Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; and Kurtz, John J., 4,205,200, Cl. 370-83.000.
Shah, Niranjan S.; and Taylor, James F., 4,205,373, Cl. 364-200.000.
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Neubert, Hans D.; Dailey, Larry R.; and Robinson, Richard S., 4,204,323, Cl. 433-38.000.
Neavel, Richard C., to Exxon Research & Engineering Co. Gasification process. 4,204,843, Cl. 48-210.000.
Negita, Mutsumi, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal vibrator electrode configuration. 4,205,248, Cl. 310-370.000.
Neis, Donald A.: *See*—
Bing, Valentijn B.; and Neis, Donald A., 4,204,302, Cl. 29-25.130.
Neisen, Jurgen, to Miele & Cie GmbH & Co. Process for the pre-treatment of non-ferrous metals to be electrophoretically covered with ceramic materials. 4,204,931, Cl. 204-181.00N.
Nelson, Jack P., to Computer Kinetics Corporation. Method and apparatus for causing a dot matrix display to appear to travel. 4,205,312, Cl. 340-792.000.
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Ness, Norman M., to Imperial Chemical Industries Limited. Pretreatment process. 4,205,101, Cl. 427-233.000.
Nestle, Mara O.: *See*—
Byers, Charles H.; Hausslein, Robert W.; and Nestle, Mara O., 4,204,869, Cl. 430-564.000.
Nestrick, Terry J.: *See*—
Wang, Chun S.; McGregor, Stanley D.; and Nestrick, Terry J., 4,205,015, Cl. 260-651.00R.
Neubert, Hans D.; Dailey, Larry R.; and Robinson, Richard S., to NDR Associates. Dental impression tray. 4,204,323, Cl. 433-38.000.
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Newberry, Mark A., to Gates Rubber Company, The. Method for making a reinforced tubular article. 4,205,034, Cl. 264-103.000.
Newman, Richard H.; Jones, William L., Jr.; and Jenkins, Robert W., Jr., to Philip Morris Incorporated. Apparatus for fractionation of a standard puff of smoke from a smoking machine. 4,204,550, Cl. 131-171.00R.
Ng, Steve Y. W.: *See*—
Dale, James A.; and Ng, Steve Y. W., 4,205,151, Cl. 526-262.000.
NGK Spark Plug Co., Ltd.: *See*—
Hattori, Yoshinori; and Miyachi, Tamotu, 4,205,033, Cl. 264-65.000.
Yamamoto, Yoshihiro; Sakurai, Kenji; and Tanaka, Hiroshi, 4,204,873, Cl. 106-43.000.
N'Guyen, Van L., to Sereg. Gas analysers of the selective radiation absorption type with a calibration cell. 4,204,768, Cl. 356-243.000.
Niccolini, Giuseppe, to Solvay & Cie. Process for the manufacture of a permeable diaphragm for an electrolysis cell. 4,204,941, Cl. 204-296.000.
Nichols, Colin J.: *See*—
Morin, Marius J.; Nichols, Colin J.; and Prouty, Myron R., 4,204,604, Cl. 215-257.000.
Nicholson, Richard R.; Smith, Ray E.; and Shukla, Jayendra G., to Velsicol Chemical Corporation. 2,2-Bis(haloalkyl)-3-hydroxy-1-propyl phosphoric acids. 4,205,022, Cl. 260-953.000.
Nield, Eric: *See*—
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,205,020, Cl. 525-275.000.
Nifco Inc.: *See*—
Sugiyama, Masaaki; and Yuda, Takuo, 4,204,960, Cl. 210-232.000.
Nigoghossian, Claude: *See*—
Bouchou, Paul; Nigoghossian, Claude; and Sillioc, Guy, 4,205,284, Cl. 333-189.000.

Nilsen, Nils F.: *See*—
Bardsley, Henry, III; Luiz, Fernando A.; Nilsen, Nils F.; and Simpson, Ronald C., 4,205,374, Cl. 364-200.000.

Nippon Chemiphar Company, Limited: *See*—
Fujimoto, Yasuo; and Yamabe, Shigeru, 4,205,170, Cl. 546-80.000.

Nippon Dentan Co., Ltd.: *See*—
Mochizuki, Toraji, 4,204,418, Cl. 72-352.000.

Nippon Electric Co., Ltd.: *See*—
Kouno, Akiyoshi; Morishita, Masanobu; and Yui, Yoshio, 4,205,340, Cl. 358-130.000.
Tsuzuki, Mitsuo; and Suga, Michihisa, 4,205,322, Cl. 346-153.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,205,334, Cl. 357-41.000.
Uchiyama, Yasuji, 4,204,452, Cl. 84-1.010.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Hiroshi; and Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, 4,205,147, Cl. 525-62.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; and Sasaki, Kanemichi, 4,205,081, Cl. 424-279.000.

Nippon Kogaku K.K.: *See*—
Toyoda, Kenji; Araki, Yoshitaka; and Watanabe, Sakuji, 4,204,755, Cl. 354-36.000.

Nippon Oil Co., Ltd.: *See*—
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Nippon Paint Co., Ltd.: *See*—
Mizuguchi, Ryuzo; Takahashi, Atsushi; Ishikura, Shin-ichi; and Uenaka, Akimitsu, 4,205,152, Cl. 526-265.000.

Nippon Steel Corporation: *See*—
Kado, Satoshi; Yamazaki, Taketomo; Sakamoto, Tetsu; Yamanaka, Mikio; and Yoshida, Kotaro, 4,204,862, Cl. 75-124.000.
Shiozaki, Morio; Okamoto, Masafumi; Tanaka, Kiyoshi; and Shimazu, Takahide, 4,204,891, Cl. 148-111.000.
Suzuki, Takao; Komatsu, Yoshimasa; Takeda, Akimichi; and Baba, Toshihiko, 4,205,214, Cl. 219-97.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Eishima, Tetsusuke; Ikariyama, Takehiro; Jinnouchi, Raizo; Oyagi, Kunioki; and Soda, Takashi, 4,205,206, Cl. 179-124.000.
Mitsuya, Eiji; Kishimoto, Tomio; Hoshida, Katsusuke; and Kamae, Naohiko, 4,205,341, Cl. 358-135.000.
Mochizuki, Tamotsu, 4,205,199, Cl. 178-19.000.
Sakai, Junichi; and Kimura, Tatsuya, 4,204,745, Cl. 350-96.310.
Yamamoto, Yousuke, 4,205,333, Cl. 357-35.000.

Nippondenso Co., Ltd.: *See*—
Harada, Susumu; Kondo, Toshio; and Eino, Tomomi, 4,204,483, Cl. 123-32.0EL.
Yoshida, Matuju, 4,205,376, Cl. 364-424.000.

Nishibara, Hazime: *See*—
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Nishimura, Yutaka: *See*—
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Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, to Murata Manufacturing Co., Ltd. Piezoelectric crystalline film of zinc oxide and method for making same. 4,205,117, Cl. 428-411.000.

Nitschke, Dean M.: *See*—
McMaster, Harold A.; Nitschke, John S.; and Nitschke, Dean M., 4,204,854, Cl. 65-106.000.

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McMaster, Harold A.; Nitschke, John S.; and Nitschke, Dean M., 4,204,854, Cl. 65-106.000.

Nitto Boseki Co., Ltd.: *See*—
Minezaki, Hisao; Haneda, Akio; Masaki, Asanori; Hanzawa, Takeo; and Uchiike, Yukio, 4,204,648, Cl. 242-18.00A.

Nitto Denki Kogyo Kabushiki Kaisha (Nitto Electric Industrial Co., Ltd.): *See*—
Miyamoto, Saburo, 4,204,905, Cl. 156-351.000.

Nitto Seiko Co., Ltd.: *See*—
Kondo, Hiroo, 4,204,439, Cl. 81-57.370.

Noack, Christian: *See*—
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.

Nohmura, Ryotaro. Bag silo. 4,204,565, Cl. 150-7.000.

Nolan, Daniel A., to Corning Glass Works. Directing glass forming constituents against a lateral surface parallel to the axis of rotation of a starting member to form a monolithic blank for an optical waveguide. 4,204,851, Cl. 65-3.00A.

Nolan, John J.: *See*—
Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., 4,204,948, Cl. 209-223.00R.

Noltes, Jan G.: *See*—
Cohen, Murray S.; Noltes, Jan G.; and van Koten, Gerard, 4,205,191, Cl. 585-250.000.

Nomoto, Tadao: *See*—
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Nomura, Shin-ichi: *See*—
Kobayashi, Shuji; Aoyagi, Mitsuo; Kanno, Tominori; Ueno, Kazuei; and Nomura, Shin-ichi, 4,205,098, Cl. 427-76.000.

Nomura, Takayuki. Cutter holding device in a polygon cutting apparatus. 4,204,442, Cl. 82-18.000.

Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, to Nippon Gakki Seizo Kabushiki Kaisha. Integrated semiconductor device. 4,205,334, Cl. 357-41.000.

Nordifa Industritextilier AB: *See*—
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Norris, Philip R., to Polaroid Corporation. Portable card motion picture viewer. 4,204,752, Cl. 352-82.000.

North American Manufacturing Company, The: *See*—
Jones, William M.; and Freas, Mark S., 4,204,830, Cl. 431-8.000.

Norton, Frank E., to Babcock & Wilcox Company, The. Method of assembling a heat exchange apparatus. 4,204,305, Cl. 29-157.400.

Nortron Corporation: *See*—
van Blerk, Victor B., 4,204,333, Cl. 33-288.000.

Nose, Kenkichi; and Mikumo, Toshihumi, to Teijin Limited. Non-uniformly wound yarn package. 4,204,653, Cl. 242-178.000.

Nouvertne, Werner: *See*—
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Novikov, Vladimir I.: *See*—
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Ulyanov, Gennady P.; and Maslov, Anatoly R., 4,205,391, Cl. 364-900.000.

Nowacki, Christopher A.: *See*—
Wu, Yeongchi; and Nowacki, Christopher A., 4,204,527, Cl. 128-762.000.

Nowak, Edmund; Zamojdo, Rudolf; Parda, Andrzej; Kurdowski, Wieslaw; and Jankowski, Stefan, to Instytut Przemyslu Maszyn Wiazacych Materialow Budowlanych. Cyclone furnace for intensive treatment or combustion of dispergated mineral raw materials. 4,204,836, Cl. 432-58.000.

Nowak, Paul. Transparent communication chart. 4,204,341, Cl. 35-1.000.

Noyes, Richard C.: *See*—
Giuggio, Nicholas; Noyes, Richard C.; and Zaman, Shakir U., 4,204,909, Cl. 176-22.000.

Nudelman, Boris I.; Bikbau, Marsel Y.; Oborin, Pavel A.; and Kuznetsova, Tamara V., to Tashkentsky Nauchnoissledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt". Raw mixture for the production of refractory high-alumina cement. 4,204,878, Cl. 106-104.000.

Nuske, Jeffrey J.: *See*—
Gothe, Diethard; Nuske, Jeffrey J.; and Friedrich, Jurgen, 4,204,427, Cl. 73-304.00C.

Nuvite Chemical Compounds Corporation: *See*—
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Nystrand, Ernst D., to Paper Converting Machine Company. Method and apparatus for zig-zag folding. 4,204,669, Cl. 270-73.000.

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Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., 4,204,948, Cl. 209-223.00R.

Oborin, Pavel A.: *See*—
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O'Brien, Joseph P.: *See*—
Papay, Andrew G.; and O'Brien, Joseph P., 4,204,969, Cl. 252-45.000.

O'Brien, Robert J., to Eastman Kodak Company. Electrographic fusing apparatus and method. 4,205,220, Cl. 219-216.000.

Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. α-Alkoxyimino-β-oxo-γ-Bromobutyric acid. 4,205,180, Cl. 560-168.000.

O'Connor, John D. Grout scrubber and cleaning tool for tile. 4,204,295, Cl. 15-209.00D.

Ofenmacher, Volker: *See*—
Seifert, Dieter; Regler, Dieter; Ofenmacher, Volker; Moritz, Alfred; Freudlsperger, August; and Berger, Walter, 4,204,515, Cl. 125-16.00R.

Ogawa, Kazufumi: *See*—
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Ogawa, Tadashi, to Pioneer Electronic Corporation. Control device of electronic preset type tuner for multi-band radio receiver. 4,205,271, Cl. 325-459.000.

Ogawa, Tadashi: *See*—
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,353, Cl. 360-61.000.

Ogawa, Toshio: *See*—
Nishiyama, Hiroshi; Ogawa, Toshio; and Mashio, Tasuku, 4,205,117, Cl. 428-411.000.

Ogitani, Osamu: *See—*
Nagasawa, Kohtaro; Ogitani, Osamu; and Fujii, Ryuichi, 4,205,018, Cl. 525-404.000.
Ogland, Thomas W. Pocket-size, adjustable exerciser. 4,204,674, Cl. 272-126.000.
Oguey, Henri J.: *See—*
Darwish, Mougahed Y.; and Oguey, Henri J., 4,205,342, Cl. 357-23.000.
Oguro, Tomokatsu, to Hitachi, Ltd. Magnetron supporting structure. 4,205,256, Cl. 315-39.510.
Oguro, Tomokatsu; Sakamoto, Tatsuji; and Yasukawa, Akio, to Hitachi, Ltd. Magnetron strap ring structure. 4,205,257, Cl. 315-39.690.
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O'Hara, David K.: *See—*
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Ohara, Ichiro, to Hitachi, Ltd. Electronic tubes. 4,205,250, Cl. 313-242.000.
Ohashi, Takashi; Kojima, Minoru; Yoshida, Masako; Okuyama, Toru; and Sakata, Ryozo, to Bridgestone Tire Company Limited. Process for producing a rigid polyurethane foam having excellent flame retardance and low-smoke development. 4,205,136, Cl. 521-118.000.
Ohbayashi-Gumi, Ltd.: *See—*
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.
Ohdan, Kyoji: *See—*
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Ohidy, Joseph: *See—*
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Ohki, Yoshinori; and Hirokichi, Komiya, to Iida Denki Kogyo K.K. Over-rotation prevention method and circuit in the non-contact type ignition circuit for the internal combustion engine. 4,204,490, Cl. 123-102.000.
Ohloff, Gunther: *See—*
Vite, Jean P.; Francke, Ernst J. W.; and Ohloff, Gunther, 4,205,084, Cl. 424-285.000.
Okada, Motohiro, to Honda Giken Kogyo Kabushiki Kaisha. Device for starting air bag devices. 4,204,703, Cl. 280-734.000.
Okada, Taiiti: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,205,180, Cl. 560-168.000.
Okamoto, Masafumi: *See—*
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Okamoto, Rokuro: *See—*
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Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, to Pioneer Electronic Corporation. Station selection indicating device. 4,205,270, Cl. 455-158.000.
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Rothgery, Eugene F., 4,204,857, Cl. 71-73.000.
Smith, Ronald J.; and Gonzalez, Manuel A., 4,205,049, Cl. 423-167.000.
Zwirlein, John F., 4,204,977, Cl. 252-359.00E.
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Olson, Edward A. Method and device for supplying venous pressure in a portal vein. 4,204,525, Cl. 128-1.00R.
Olson, Jan B., to Sierracin Corporation, The. Edge design for impact resistant windshield. 4,204,374, Cl. 52-208.000.
Oltrogge, Victor C. Universal quick detach accessory mount for vehicles or the like. 4,204,701, Cl. 280-491.00E.
Oltrogge, Victor C. Universal quick detach accessory mount for vehicles or the like. 4,204,702, Cl. 280-491.00E.
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Imai, Toshihiro, 4,204,747, Cl. 350-216.000.
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Miyashita, Kiyoshi; and Kasuga, Muneo, 4,204,730, Cl. 355-14.00R.
Tsuda, Hiroshi, 4,204,621, Cl. 226-137.000.
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Onoda Cement Co., Ltd.: *See—*
Yamamoto, Masahiro; Okamoto, Yasunari; Itoh, Tsutomu; and Masuda, Senichi, 4,205,359, Cl. 361-58.000.
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Dunchock, Richard S., 4,204,602, Cl. 211-13.000.
Optilon W. Erich Heilmann GmbH: *See—*
Heimberger, Helmut, 4,205,027, Cl. 264-23.000.
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Koshkin, Jury N.; Ordynsky, Georgy V.; Shkhiyan, Tsolak G.; Shapkin, Alexandr F.; Fadeev, Alexandr I.; Laptev, Fedor V.; Batjukov, Vladimir I.; Korolkov, Konstantin I.; and Borodin, Ivan V., 4,204,910, Cl. 176-30.000.
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Young, Paul T. K., 4,205,317, Cl. 343-720.000.
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Bianchi, Giuseppe; deNora, Oronzio; and Spaziante, Placido M., 4,204,937, Cl. 204-219.000.
Orsen, Stefan: *See—*
Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., 4,205,385, Cl. 364-560.000.
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Otto, George W., Jr.: *See—*
Craig, James R.; and Otto, George W., Jr., 4,205,233, Cl. 250-439.00R.
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Canney, Robert S.; Ouellette, Ronald J.; and Morong, William H., Jr., 4,205,290, Cl. 336-90.000.
Outboard Marine Corporation: *See—*
Blanchard, Clarence E., 4,204,806, Cl. 416-134.00R.
Holtermann, Theodore J., 4,204,384, Cl. 56-10.500.
Morris, Richard L., 4,204,511, Cl. 123-187.50R.
Ouyang, Mid: *See—*
Boyle, Malachy V.; and Ouyang, Mid, 4,205,198, Cl. 174-171.000.
Ovshinsky, Stanford R.; Klose, Peter H.; and Messing, Wayne P., to Energy Conversion Devices, Inc. Data storage and retrieval system. 4,205,387, Cl. 364-900.000.
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Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev,

Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.
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Arts, Jerold F.; Owen, William L., Jr.; and Tull, Bernie D., Jr., 4,205,239, Cl. 307-328.000.
Owens-Corning Fiberglas Corporation: *See*—
Calvert, Scott A., 4,204,376, Cl. 52-309.100.
Owens-Illinois, Inc.: *See*—
Byrum, Bernard W., Jr.; Ernsthausen, Roger E.; and Fein, Michael E., 4,205,392, Cl. 365-116.000.
Oyagi, Kunioki: *See*—
Eishima, Tetsusuke; Ikariyama, Takehiro; Jinnouchi, Raizo; Oyagi, Kunioki; and Soda, Takashi, 4,205,206, Cl. 179-124.000.
Oyama, Yoshishige; Yamauchi, Teruo; and Nishimura, Yutaka, to Hitachi, Ltd. Control system for internal combustion engine. 4,205,377, Cl. 364-431.000.
P. H. Thermal Products Limited: *See*—
Blundell, Kenneth, 4,205,105, Cl. 428-36.000.
Pack, Howard, Jr. Wind powered apparatus. 4,204,796, Cl. 415-2.000.
Paglione, Robert W., to RCA Corporation. Coaxial applicator for microwave hyperthermia. 4,204,549, Cl. 128-784.000.
Pak, Ian T. Overflow protection apparatus. 4,204,285, Cl. 4-427.000.
Pal, Dharam; Huang, Kwang T.; and Smith, Maurice N., to United States of America, Navy. Automatic electrical load matching device for wind generators. 4,205,235, Cl. 290-44.000.
Palmer, Nigel I.; and Grammer, Don O., to W. R. Grace & Co. Battery separator with porous body and fused rib. 4,205,123, Cl. 429-147.000.
Papay, Andrew G.; and O'Brien, Joseph P., to Edwin Cooper, Inc. Lubricant composition containing sulfurized olefin extreme pressure additive. 4,204,969, Cl. 252-45.000.
Paper Converting Machine Company: *See*—
Nystrand, Ernst D., 4,204,669, Cl. 270-73.000.
Paradis, Joseph R. Controlled removal of molded parts. 4,204,824, Cl. 425-436.00R.
Parda, Andrzej: *See*—
Nowak, Edmund; Zamojdo, Rudolf; Parda, Andrzej; Kurdowski, Wieslaw; and Jankowski, Stefan, 4,204,836, Cl. 432-58.000.
Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; and Kurtz, John J., to NCR Corporation. Digital communications system utilizing controllable field size. 4,205,200, Cl. 370-83.000.
Parish, Edward C., to Motorola, Inc. Temperature stabilized helical resonator. 4,205,286, Cl. 333-226.000.
Parker, David G.; and Tompsett, Alan J., to Imperial Chemical Industries Limited. Manufacture of amines from alcohols with zeolite FU-1 catalysts. 4,205,012, Cl. 260-583.00J.
Parker-Hannifin Corporation: *See*—
Cyrot, Luc P., 4,204,457, Cl. 91-31.000.
Parks, Frank, Jr. Pass through hay bale retriever. 4,204,789, Cl. 414-24.500.
Pasha, Mohiuddin; O'Hara, David K.; and French, Joseph A., to American Air Filter Company, Inc. Method and composition for removing iodine from gases. 4,204,980, Cl. 252-428.000.
Paskins, Keith N.; Redman, Duncan C.; and Turner, Ian D., to Williams (Hounslow) Limited. Amino acid salts of anionic dyestuffs which have high solubility in organic solvents. 4,204,879, Cl. 106-311.000.
Patel, Arvind M., to International Business Machines Corporation. Methods and means for simultaneously correcting several channels in error in a parallel multi channel data system using continuously modifiable syndromes and selective generation of internal channel pointers. 4,205,324, Cl. 371-50.000.
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Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; and Kurtz, John J., 4,205,200, Cl. 370-83.000.
Patnaik, Haresh C.: *See*—
Parikh, Bipin D.; Patnaik, Haresh C.; Patel, Bhagubhai K.; Dharia, Prabodh M.; and Kurtz, John J., 4,205,200, Cl. 370-83.000.
Patton, Franklin D.; and McFarlane, James D., to Westbay Instruments Ltd. Measuring casing coupler apparatus. 4,204,426, Cl. 73-151.000.
Paulisch, Karlheinz: *See*—
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.
Payne, Archibald H.: *See*—
Rouse, John W.; and Payne, Archibald H., 4,204,641, Cl. 239-121.000.
Pearl, David R., to Gerber Garment Technology, Inc. Fluid jet cutting apparatus having self-healing bed. 4,204,448, Cl. 83-177.000.
Pease, William M., to Raytheon Company. Marine radar including anticollision unit. 4,205,313, Cl. 343-5.0DP.
Peckinpaugh, Frank L.; and Biron, Raymond J., to Allied Chemical Corporation. Quench system for synthetic fibers using fog and flowing air. 4,204,828, Cl. 425-72.00S.
Pence, Valerie C.: *See*—
Janick, Jules; and Pence, Valerie C., 4,204,366, Cl. 47-58.000.
Pennwalt Corporation: *See*—
Monsimer, Harold G.; and Bohm, Howard A., 4,205,060, Cl. 424-14.000.
Shetty, Bola V., 4,205,173, Cl. 546-218.000.
Peperone, Salvador J., to United States of America, Army. Enhanced accuracy doppler fuze. 4,205,316, Cl. 343-14.000.
Pereira, Robert J., Jr., to Phase Industries, Inc. Microcapacitors having beveled edges and corners. 4,205,364, Cl. 361-274.000.
Perepolkin, John. Fuel vaporizing devices for internal combustion engines. 4,204,485, Cl. 123-34.00A.
Perkin-Elmer Corporation, The: *See*—
Gerlach, Robert, 4,205,226, Cl. 250-305.000.
Hartsough, Larry D., 4,204,936, Cl. 204-192.00R.
Perobelli, Aldo: *See*—
Pessina, Giorgio; and Perobelli, Aldo, 4,204,671, Cl. 271-186.000.
Perry Bros. (Hall Green) Limited: *See*—
Perry, Donald J., 4,205,106, Cl. 428-45.000.
Perry, Donald J., to Perry Bros. (Hall Green) Limited. Doors. 4,205,106, Cl. 428-45.000.
Pessina, Giorgio; and Perobelli, Aldo. Sheet stacking machine. 4,204,671, Cl. 271-186.000.
Peters, Lester G. De-stoning and simultaneously filling a drupe. 4,204,467, Cl. 99-494.000.
Petersson, Stig A.; and Eriksson, Bengt S., to Boliden Aktiebolag. Method of producing blister copper. 4,204,861, Cl. 75-73.000.
Petroff, Pierre M.: *See*—
Dingle, Raymond; Gossard, Arthur C.; Petroff, Pierre M.; and Wiegmann, William, 4,205,329, Cl. 357-16.000.
Pfeiffer, Hans-Dieter: *See*—
Johannes, Gunter; and Pfeiffer, Hans-Dieter, 4,204,567, Cl. 152-209.00D.
Pfetzing, Rodger E. Arrow fletching method. 4,204,307, Cl. 29-407.000.
Phase Industries, Inc.: *See*—
Pereira, Robert J., Jr., 4,205,364, Cl. 361-274.000.
Philip Morris Incorporated: *See*—
Newman, Richard H.; Jones, William L., Jr.; and Jenkins, Robert W., Jr., 4,204,550, Cl. 131-171.00R.
Phillips, Norman S.; and Walcott, William B., to United States of America, Navy. Energy absorber. 4,204,659, Cl. 248-562.000.
Phillips Petroleum Company: *See*—
Bjornson, Geir, 4,205,017, Cl. 585-469.000.
Ford, Gregory A., 4,204,962, Cl. 210-316.000.
Makovec, Donald J.; and Haskell, Donald M., 4,205,196, Cl. 585-701.000.
Reese, Herbert E.; and Clayton, Hadwen A., 4,204,808, Cl. 417-2.000.
Richards, Frank P.; and Taylor, Raymond C., 4,204,462, Cl. 93-36.50R.
Vanderveen, John W., 4,204,831, Cl. 431-10.000.
Walker, Starnes E., 4,204,424, Cl. 73-23.100.
Phillips, Robert F.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefever, Joseph D., 4,204,918, Cl. 204-24.000.
Piccirilli, Robert M.; Chang, Wen-Hsuan; McKeough, David T.; and Porter, Samuel, Jr., to PPG Industries, Inc. Polyester coating composition. 4,205,115, Cl. 428-334.000.
Pick, Anthony J.: *See*—
Wagner, Daniel B.; Pick, Anthony J.; and Feingers, Judith, 4,205,058, Cl. 424-1.000.
Pickens, George O., to United States of America, Navy. Sealed cavity hydrophone array calibration. 4,205,394, Cl. 367-13.000.
Piehl, Robert L.; and Scarborough, W. Bertram, to Chevron Research Company. Method of reducing corrosion in sour gas sweetening systems. 4,205,050, Cl. 423-228.000.
Pike, Marshall; Barr, Iain G.; and Tirtiaux, Florent. Glycerides. 4,205,095, Cl. 426-607.000.
Pikin, Nikolai I.: *See*—
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.
Pilat, Michael J. Liquid transfer system for conductive liquids. 4,204,844, Cl. 55-10.000.
Pilkington Brothers Limited: *See*—
Watts, Julian K.; and Yarker, Colin A., 4,204,852, Cl. 65-4.00A.
Pioneer Electronic Corporation: *See*—
Inaba, Shizuo; and Hirota, Yoshihisa, 4,204,687, Cl. 274-15.00R.
Ogawa, Tadashi, 4,205,271, Cl. 325-459.000.
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Pip, Wolfgang; and Winter, Klaus, to Rohm GmbH. Laminates comprising a foamed polyimide layer. 4,205,111, Cl. 428-215.000.
Pisano, Vincent F. Mini-indoor TV antenna. 4,205,318, Cl. 343-741.000.
Pitroda, Satyan G.: *See*—
Mehta, Madhu A.; Pitroda, Satyan G.; and Vasanthkumar, Sagunabalan, 4,205,203, Cl. 370-110.000.
Plaige, Yves, to Commissariat a l'Energie Atomique. Device for progressive electrical switching. 4,205,240, Cl. 307-350.000.
Plate, Hermann: *See*—
Jaschke, Hans; Kautz, Rudolf; Plate, Hermann; and Ulb, Horst, 4,205,107, Cl. 428-58.000.
Platonov, Vladimir N.: *See*—
Kononov, Ivan V.; Makushin, Mikhail P.; Maslennikov, Ivan E.; Platonov, Vladimir N.; and Silantiev, Igor I., 4,204,458, Cl. 91-429.000.
Platt Saco Lowell Limited: *See*—
Clayton, James W. B.; and Clough, Douglas O., 4,204,391, Cl. 57-1.00R.

Plo, Mateo O. Flying toy. 4,204,359, Cl. 46-83.000.

Pochwalski, Krzysztof K., to Instytut Badan Jadrowych. Device for light flux attenuation, especially for additional quenching of scintillations at radionuclide activity determination. 4,205,231, Cl. 250-364.000.

Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M. Radiation curable polyborsiloxane polymer composition and method of using same to produce thermostable insulating materials. 4,205,026, Cl. 264-22.000.

Podjan, Walter H. Bird feeder construction. 4,204,500, Cl. 119-52.00R.

Podolsky, Daniel K.; and Weiser, Milton M., to Massachusetts General Hospital, The. Method for purifying galactosyltransferase isoenzymes and product. 4,205,129, Cl. 435-193.000.

Pogorzhelsky, Viktor I.: *See—*
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.

Pohlmann, Charles. Lightweight resuscitator assembly. 4,204,535, Cl. 128-202.130.

Poinas, Christian, to Societe Anonyme Dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Phase locked loop with switchable filter. 4,205,277, Cl. 331-12.000.

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Byers, Charles H.; Hausslein, Robert W.; and Nestle, Mara O., 4,204,869, Cl. 430-564.000.
Norris, Philip R., 4,204,752, Cl. 352-82.000.

Poling, Stephen M.: *See—*
Yokoyama, Henry; Hayman, Ernest P.; Hsu, Wan-Jean; and Poling, Stephen M., 4,204,859, Cl. 71-121.000.

Popov, Alexandr N.: *See—*
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.

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Porter, Cyril A.; and Wardle, Malcolm R., to GEC-General Signal Limited. Data communication apparatus. 4,205,326, Cl. 340-147.00R.

Porter, Edward S., to Fuller Company. Apparatus for treating solid particulate material. 4,204,835, Cl. 432-58.000.

Porter, Samuel, Jr.: *See—*
Piccirilli, Robert M.; Chang, Wen-Hsuan; McKeough, David T.; and Porter, Samuel, Jr., 4,205,115, Cl. 428-334.000.

Potts, Irvin W., Jr., to Dow Chemical Company, The. Process for 1,2,4,5-tetrachlorobenzene. 4,205,014, Cl. 260-650.00R.

Pove, Dusan: *See—*
Erche, Manfred; Filberich, Ludwig; Pove, Dusan; Waldmann, Hermann; and Weibelzahl, Manfred, 4,205,368, Cl. 363-35.000.

Powell, David G.: *See—*
Bilbrey, Robert A.; Munroe, William O.; and Powell, David G., 4,204,513, Cl. 123-198.0DB.

Poze, Anthony N.: *See—*
Gordon, William J. J.; and Poze, Anthony N., 4,204,705, Cl. 283-1.00R.

PPG Industries, Inc.: *See—*
Goldinger, John A., 4,204,445, Cl. 83-880.000.
Piccirilli, Robert M.; Chang, Wen-Hsuan; McKeough, David T.; and Porter, Samuel, Jr., 4,205,115, Cl. 428-334.000.
Seymour, Samuel L., 4,204,853, Cl. 65-106.000.
Shields, George B.; and Starr, Eugene W., 4,204,845, Cl. 65-25.00A.
Stevens, Henry C., 4,205,154, Cl. 526-314.000.
Yigdall, Jeffrey S.; and Zahler, James A., 4,204,856, Cl. 65-157.000.

Precision Plumbing Products, Inc.: *See—*
Sullivan, Richard N., 4,204,556, Cl. 137-206.000.

Prestridge, Floyd L.: *See—*
Warren, Kenneth W.; and Prestridge, Floyd L., 4,204,934, Cl. 204-186.000.

Pretron Electronics Pty. Ltd.: *See—*
Stubbs, Raymond F., 4,205,230, Cl. 250-356.000.

Principe, Pacifico A.: *See—*
Sykes, Richard B.; Wells, J. Scott; Principe, Pacifico A.; and Liu, Wen C., 4,205,068, Cl. 424-117.000.

Prinz, Richard: *See—*
Liebig, Lothar; Wingler, Frank; Humme, Gert; and Prinz, Richard, 4,205,141, Cl. 525-67.000.

Pritchard, Huw O.: *See—*
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Pritchard, Sheldon S., to Champion International Corporation. Dual pocket envelope. 4,204,600, Cl. 206-610.000.

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Baird, James C.; and Warfield, Glenn R., 4,205,094, Cl. 426-459.000.
McCarthy, Robert F., 4,204,615, Cl. 222-153.000.
Strobel, Rudolf G. K., 4,204,464, Cl. 99-286.000.

Prouty, Myron R.: *See—*
Morin, Marius J.; Nichols, Colin J.; and Prouty, Myron R., 4,204,604, Cl. 215-257.000.

Prussin, Samuel: *See—*
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,205,096, Cl. 427-4.000.

Pryor, Cabell N., Jr., to United States of America, Navy. Automatic DIFAR cardioid former. 4,205,396, Cl. 367-125.000.

Pue, Alan J.: *See—*
Gulick, Joseph F.; Miller, James S.; and Pue, Alan J., 4,204,655, Cl. 244-3.190.

Pujolle, Jean; and Bourcet, Patrice, to Telediffusion de France. Acoustic insulation measurement apparatus. 4,204,432, Cl. 73-599.000.

Purdue Research Foundation: *See—*
Janick, Jules; and Pence, Valerie C., 4,204,366, Cl. 47-58.000.

Puthawala, Anwer; Hoffmann, Lutz; Emmert, Hermann; Hild, Werner; John, Hans-Erich; and Kluger, Wolfgang, to Kraftwerk Union Aktiengesellschaft. Method for removing radioactive plastic wastes and apparatus therefor. 4,204,974, Cl. 252-301.10W.

PVI Industries, Inc.: *See—*
Clark, David W., 4,204,573, Cl. 165-142.000.

Pyle, Walter R., to Chevron Research Company. Discharge spout tip for a liquid fuel-dispensing nozzle. 4,204,563, Cl. 141-206.000.

Pyramid Manufacturing Company: *See—*
Bryan, John F., Jr., 4,204,664, Cl. 254-175.700.

Qualcast (Lawn Mowers) Limited: *See—*
Dawson, Frank, 4,204,388, Cl. 56-320.100.

Questor Corporation: *See—*
Cone, Richard E., 4,204,367, Cl. 47-71.000.
Molitor, Robert P., 4,204,684, Cl. 273-167.00R.

Quick, Donald J., to Massey-Ferguson Services N.V. Mobile planting apparatus. 4,204,491, Cl. 111-3.000.

Qume Corporation: *See—*
Lee, Sen L.; Shah, Franklin B.; and Jamieson, John W., 4,204,779, Cl. 400-144.200.

R. M. Wade & Co.: *See—*
Cornelius, Gail, 4,204,643, Cl. 239-212.000.

Rabito, Thomas G.: *See—*
Streets, Roger L.; Rabito, Thomas G.; and Von Kamp, John, 4,204,987, Cl. 260-29.20E.

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Hennart, Claude; Rabussier, Bernard; Mandon, Jean-Pierre; and Sapin, Joel, 4,205,066, Cl. 424-84.000.

Rain Jet Corporation: *See—*
Hruby, John O., Jr., 4,204,631, Cl. 239-17.000.

Rakshys, Joseph W.: *See—*
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,205,016, Cl. 260-665.00R.

Randall, John J., Jr.; and Bernard, Walter J., to Sprague Electric Company. Treating etched aluminum electrolytic capacitor foil. 4,204,919, Cl. 204-29.000.

Rank Organisation Limited, The: *See—*
Millward, John D., 4,205,337, Cl. 358-54.000.

Rau, Willy; and Taus, Christian, to Maschinenfabrik Rau oHG. Cultivator with pivotal tines. 4,204,579, Cl. 172-657.000.

Rauner, Frederick J.: *See—*
Horak, Jerry R.; Langworthy, Harold F.; Rauner, Frederick J.; and Gross, Robert C., 4,204,866, Cl. 430-306.000.

Rauschenbach, Stefan: *See—*
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.

Rauscher, Walter: *See—*
Auracher, Franz; Zeitler, Karl-Heinz; and Rauscher, Walter, 4,204,310, Cl. 29-445.000.

Ravn, Jacob; and Conard, William A., to West Company, The. Container-closure assembly. 4,204,605, Cl. 215-295.000.

Raynaud, Bernard: *See—*
Thuries, Edmond; Raynaud, Bernard; and Scarato, Armand, 4,205,209, Cl. 200-163.000.

Rayner, Bruce L., to Tektronix, Inc. Special effects memory system. 4,205,344, Cl. 358-160.000.

Raytheon Company: *See—*
Craig, James R.; and Otto, George W., Jr., 4,205,233, Cl. 250-439.00R.
Pease, William M., 4,205,313, Cl. 343-5.0DP.

RCA Corporation: *See—*
Paglione, Robert W., 4,204,549, Cl. 128-784.000.
Staebler, David L., 4,205,265, Cl. 324-158.00D.

Rechsteiner, Oswald: *See—*
Aufderhaar, Ernst; Gallay, Jean J.; Kuhne, Manfred; Meyer, Alfred; Rechsteiner, Oswald; Schellenbaum, Max; and Fumeaux, Jean-Paul, 4,205,077, Cl. 424-273.00B.

Recognition Systems, Inc.: *See—*
Balasubramanian, N., 4,204,772, Cl. 356-376.000.

Redman, Duncan C.: *See—*
Paskins, Keith N.; Redman, Duncan C.; and Turner, Ian D., 4,204,879, Cl. 106-311.000.

Reed, Bruce S., to Texas Instruments Incorporated. Single junction emitter array. 4,205,227, Cl. 250-330.000.

Reed, Steven P.; and Kinkead, Jordan A., to Sven Tveter. Dispenser for roll of ticket tapes and the like. 4,204,618, Cl. 225-106.000.

Reed, William R., Jr.: *See—*
Ibsen, Robert L.; Glace, William R.; and Reed, William R., Jr., 4,204,978, Cl. 252-408.000.

Reese, Herbert E.; and Clayton, Hadwen A., to Phillips Petroleum Company. Flow control. 4,204,808, Cl. 417-2.000.

Reeve, Randy F., to Diamond International Corporation. Fluid dispenser having a spring biased locking mechanism for a safety nozzle cap. 4,204,614, Cl. 222-153.000.
Regler, Dieter: *See*—
Seifert, Dieter; Regler, Dieter; Ofenmacher, Volker; Moritz, Alfred; Freudlsperger, August; and Berger, Walter, 4,204,515, Cl. 125-16.00R.
Rehabilitation Institute of Chicago: *See*—
Wu, Yeongchi; and Nowacki, Christopher A., 4,204,527, Cl. 128-762.000.
Reichert, Leonard K. Cutting block employing cuttable rods. 4,204,451, Cl. 83-658.000.
Reichhold Chemicals, Incorporated: *See*—
Mervin, Gaillard A., 4,205,112, Cl. 428-245.000.
Reichle, Walter T.: *See*—
Cardenas, Jorge N.; and Reichle, Walter T., 4,205,187, Cl. 568-730.000.
Reilly, Richard J. Fluid dynamic furnace cleaning system. 4,204,296, Cl. 15-316.00R.
Reilly, Richard J.; and Moorhead, John K. Fluid dynamic soot blower system. 4,204,503, Cl. 122-392.000.
Remport nee Radoczi, Julia: *See*—
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.
Resista Fabrik Elektrischer Widerstande G.m.b.H.: *See*—
Klesse, Fritz; and Forster, Jurgen, 4,204,935, Cl. 204-192.00F.
Reum, Donald J. Apparatus for producing a spirally wound plastic article. 4,204,818, Cl. 425-66.000.
Reynolds, Anthony C. Valve for controlling the flow of fluids in conduits and the like. 4,204,662, Cl. 251-334.000.
Reynolds Metals Company: *See*—
Kibby, Robert M., 4,204,860, Cl. 75-10.00R.
Rhodes, Maurice: *See*—
Barlow, William A.; Rhodes, Maurice; Sherliker, Francis R.; and Williams, Edward W., 4,204,933, Cl. 204-181.00N.
Rhone-Poulenc Industries: *See*—
Bachot, Jean; Bouy, Pierre; and Juillard, Michel, 4,204,938, Cl. 204-252.000.
Desbois, Michel, 4,205,195, Cl. 585-510.000.
Richards, Frank P.; and Taylor, Raymond C., to Phillips Petroleum Company. Container handling and finishing apparatus. 4,204,462, Cl. 93-36.50R.
Richards, Harvey J.: *See*—
Kyung, Jai H.; and Richards, Harvey J., 4,205,048, Cl. 423-24.000.
Richardson, John, to Hayward Tyler Limited. Production of cable joints. 4,204,896, Cl. 156-49.000.
Richardson Manufacturing Company, Inc.: *See*—
Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., 4,204,575, Cl. 172-1.000.
Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., to Richardson Manufacturing Company, Inc. Method of folding a plurality of wing sections of an articulated implement. 4,204,575, Cl. 172-1.000.
Ricoh Company, Ltd.: *See*—
Fujii, Tadashi, 4,205,320, Cl. 346-1.100.
Inokuchi, Toshiyuki, 4,204,729, Cl. 355-11.000.
Kawazu, Motoaki; Yokota, Takashi; Inokuchi, Toshiyuki; and Kanmoto, Yoshiaki, 4,205,349, Cl. 358-294.000.
Yanagawa, Nobuyuki, 4,204,668, Cl. 271-9.000.
Riedel, Richard: *See*—
Schoetensack, Wolfgang; and Riedel, Richard, 4,205,088, Cl. 424-319.000.
Riethmann, Jean: *See*—
Gremmelmaier, Claude; and Riethmann, Jean, 4,205,167, Cl. 544-209.000.
Rilling, Raymond J.: *See*—
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,204,576, Cl. 172-22.000.
Ritter, Ernst; Schwartz, Reinhard; Muuller, Rolf; Sturm, Waldemar; and Faupel, Werner, to Robert Bosch GmbH. RPM Governor for fuel injected internal combustion engines. 4,204,510, Cl. 123-179.00L.
Rittler, Roland: *See*—
Moser, Theo; Andra Rolf; Rittler, Roland; and Strampfer, Armin, 4,204,951, Cl. 209-625.000.
Robbins, Lanny A.: *See*—
Muench, Wayne C.; Hormel, Thad S.; Kirchhoff, Pamela M.; and Robbins, Lanny A., 4,205,188, Cl. 568-764.000.
Robert Bosch GmbH: *See*—
Jundt, Werner; Bodig, Bernd; Roozenbeek, Herman; and Werner, Peter, 4,204,508, Cl. 123-148.00E.
Moser, Theo; Andra Rolf; Rittler, Roland; and Strampfer, Armin, 4,204,951, Cl. 209-625.000.
Ritter, Ernst; Schwartz, Reinhard; Muuller, Rolf; Sturm, Waldemar; and Faupel, Werner, 4,204,510, Cl. 123-179.00L.
Robinson, Richard S.: *See*—
Neubert, Hans D.; Dailey, Larry R.; and Robinson, Richard S., 4,204,323, Cl. 433-38.000.
Robinson, Roger A. Smoking pipe accessory for automobile gearshift lever. 4,204,551, Cl. 131-178.000.
Robinson, Sidney H.: *See*—
Laughton, Malcolm; and Robinson, Sidney H., 4,204,352, Cl. 40-389.000.
Rogers, James G.: *See*—
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,420, Cl. 72-439.000.
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,421, Cl. 72-439.000.
Rogers, Norman H.; and O'Hanlon, Peter J., to Beecham Group Limited. Antibacterial compounds. 4,205,002, Cl. 260-345.80R.
Rogers, Peter T.: *See*—
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,420, Cl. 72-439.000.
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,421, Cl. 72-439.000.
Rogers, Richard J.: *See*—
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Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., 4,204,421, Cl. 72-439.000.
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., to Marion Plywood Corporation. Laminated board and hammer combination for a drop hammer forge. 4,204,420, Cl. 72-439.000.
Rogers, Thomas E.; Rogers, Richard J.; Rogers, Peter T.; and Rogers, James G., to Marion Plywood Corporation. Laminated board and hammer combination for a drop hammer forge. 4,204,421, Cl. 72-439.000.
Rohm GmbH: *See*—
Pip, Wolfgang; and Winter, Klaus, 4,205,111, Cl. 428-215.000.
Rohrscheid, Karl, to System Schultheis GmbH & Co. Warp beam elevating and transport carriage for twin warp beams. 4,204,797, Cl. 414-458.000.
Rollmann, Louis D.; and Valyocsik, Ernest W., to Mobil Oil Corporation. Manufacture of synthetic mordenite. 4,205,052, Cl. 423-329.000.
Rollmann, Louis D.; and Valyocsik, Ernest W., to Mobil Oil Corporation. Manufacture of nitrogenous zeolites. 4,205,053, Cl. 423-329.000.
Rolls-Royce Limited: *See*—
Bridges, Stuart A., 4,204,629, Cl. 228-160.000.
Howe, David M., 4,204,403, Cl. 60-743.000.
Romans, Ralph H. Injection molding machine. 4,204,827, Cl. 425-551.000.
Romanzi, Louis, Jr.: *See*—
Cislak, Raymond S.; and Romanzi, Louis, Jr., 4,204,652, Cl. 242-107.40R.
Romey, Ingo; Schlutter, Aloys; and Sommerfeld, Rolf, to Bergwerksverband GmbH; and Ruhrkohle AG. Sealing, caulking and protective shielding composition of thermoplastic synthetic materials and carbonaceous materials. 4,204,986, Cl. 260-28.5AS.
Romey, Ingo: *See*—
Kroger, Carl; Romey, Ingo; and Kolling, Georg, 4,205,035, Cl. 264-120.000.
Roos, Friedrich; and Bahner, Friedrich, to Babcock-BSH Aktiengesellschaft vormals Buttner-Schilde-Haas AG. Method and apparatus for monitoring and controlling the drying profile in a continuous-operation multi-zone drier. 4,204,337, Cl. 34-31.000.
Roozenbeek, Herman: *See*—
Jundt, Werner; Bodig, Bernd; Roozenbeek, Herman; and Werner, Peter, 4,204,508, Cl. 123-148.00E.
Rosa, Gilbert L. Coil containment cover. 4,204,479, Cl. 206-397.000.
Rose, John B.: *See*—
Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,205,020, Cl. 525-275.000.
Rosemount Inc.: *See*—
Dahlke, Charles J., 4,205,327, Cl. 340-208.000.
Rosenberg, David. Roof comprising roofing tiles with solar water heating system therein. 4,204,520, Cl. 126-432.000.
Rosenburgh, Norman J.: *See*—
Modney, William; and Rosenburgh, Norman J., 4,204,733, Cl. 355-64.000.
Rosendal, Hans: *See*—
Braad, Poul E.; Jensen, Knud B.; Rosendal, Hans; and Sevaldsen, Flemming, 4,204,415, Cl. 72-52.000.
Ross, John D., to Ross Video Limited. Video transition circuitry including transition previewing means. 4,205,346, Cl. 358-181.000.
Ross Video Limited: *See*—
Ross, John D., 4,205,346, Cl. 358-181.000.
Rothaemel, Gunther; and Fengels, Gerd, to Bruggemann & Brand KG. Rescue net. 4,204,710, Cl. 294-77.000.
Rothbart, Herbert L.: *See*—
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,205,006, Cl. 260-410.700.
Rothe, Eva, to E. Cacarda GmbH. Mount for solar collectors. 4,204,523, Cl. 126-450.000.
Rothgery, Eugene F., to Olin Corporation. 5-Xanthogenato-3-trihalomethyl-1,2,4-thiadiazoles and their use as herbicides. 4,204,857, Cl. 71-73.000.
Rothmayer, Jules: *See*—
Johnson, Mark U.; Rothmayer, Jules; and Smith, Hugh M., 4,204,871, Cl. 106-20.000.
Rouse, John W.; and Payne, Archibald H., to American Can Company. Dispensing nozzle for sealing plastics. 4,204,641, Cl. 239-121.000.
Roussel Uclaf: *See*—
Martel, Jacques; and Tessier, Jean, 4,205,008, Cl. 260-456.00R.
Vignau, Michel; and Lutz, Andre, 4,205,072, Cl. 424-246.000.
Rowe, Gerhardt C.: *See*—
Erickson, Kent E.; Orsen, Stefan; and Rowe, Gerhardt C., 4,205,385, Cl. 364-560.000.

Rowlings, James W. Flush door bolt bore forming jig. 4,204,785, Cl. 408-109.000.

Rubin, Wallace: *See—*
Allen, Bernard M.; Rubin, Wallace; and Watson, Brian, 4,204,889, Cl. 148-26.000.

Ruh, Herbert: *See—*
Ullmann, Werner; Buhler, Ernst; Kilcher, Beat; Ruh, Herbert; and Sieg, Arno, 4,205,212, Cl. 219-69.00W.

Ruhrchemie Aktiengesellschaft: *See—*
Weber, Jurgen; and Springer, Helmut, 4,205,013, Cl. 568-451.000.

Ruhrkohle AG: *See—*
Romey, Ingo; Schlutter, Aloys; and Sommerfeld, Rolf, 4,204,986, Cl. 260-28.5AS.

Rumore, Peter J.: *See—*
Lind, Herbert C.; Rumore, Peter J.; and Wysocki, Tadeusz S., 4,204,532, Cl. 128-132.00D.

Rumsey, Joseph N. Fireplace furnace. 4,204,517, Cl. 126-63.000.

Ruszala, Frederick B.; and Cook, Kenneth J., to Valeron Corporation, The. Electrocardiographic and blood pressure waveform simulator device. 4,205,386, Cl. 364-607.000.

S.B.W. Engineers Limited: *See—*
Workman, John, 4,204,314, Cl. 29-597.000.

Sabatka, Winston E., to Finishing Equipment, Inc. Solvent recovery apparatus. 4,204,913, Cl. 202-168.000.

SACK GmbH: *See—*
Kersting, Emil F.; and Schulte, Rolf, 4,204,449, Cl. 83-328.000.

Safin, Rinat R.: *See—*
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Sahara, Masayoshi: *See—*
Kobori, Toshio; Sahara, Masayoshi; and Saito, Mitsuru, 4,204,756, Cl. 354-53.000.

Sai-Halasz, George A.: *See—*
Esaki, Leo; Sai-Halasz, George A.; and Chang, Leroy L., 4,205,331, Cl. 357-30.000.

Saint Gobain Industries: *See—*
Chenel, Pierre, 4,205,104, Cl. 428-34.000.

Saito, Masaharu: *See—*
Toyoura, Hirozumi; and Saito, Masaharu, 4,204,583, Cl. 180-9.280.

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Kobori, Toshio; Sahara, Masayoshi; and Saito, Mitsuru, 4,204,756, Cl. 354-53.000.

Sakai, Junichi; and Kimura, Tatsuya, to Nippon Telegraph and Telephone Public Corporation. Optical fiber. 4,204,745, Cl. 350-96.310.

Sakaki, Masamichi: *See—*
Inoue, Yuichiro; and Sakaki, Masamichi, 4,204,422, Cl. 73-4.00R.

Sakamaki, Hisashi: *See—*
Goshima, Yoshitomo; Kawakubo, Kazuo; Furuichi, Katsushi; Sakamaki, Hisashi; Sawamura, Osamu; Komiya, Yutaka; and Tomosada, Masahiro, 4,204,728, Cl. 355-4.000.

Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; and Sasaki, Kanemichi, to Nippon Kayaku Kabushiki Kaisha; and Chugai Seiyaku Kabushiki Kaisha. Composition and method for preventing or treating swine dysentery. 4,205,081, Cl. 424-279.000.

Sakamoto, Tatsuji: *See—*
Oguro, Tomokatsu; Sakamoto, Tatsuji; and Yasukawa, Akio, 4,205,257, Cl. 315-39.690.

Sakamoto, Tetsu: *See—*
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Sakata, Ryozo: *See—*
Ohashi, Takashi; Kojima, Minoru; Yoshida, Masako; Okuyama, Toru; and Sakata, Ryozo, 4,205,136, Cl. 521-118.000.

Sakurai, Kenji: *See—*
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Sakurai, Kiyoshi; Matsumoto, Tateo; and Ishikawa, Teruo, to Honeywell Inc. Address converter. 4,205,390, Cl. 364-900.000.

Sakurai, Yoshiki: *See—*
Hamanaka, Kunio; and Sakurai, Yoshiki, 4,205,355, Cl. 360-99.000.

Salway-Waller, Malcolm; and Langton, Frederick H., to USM Corporation. High frequency cavity press. 4,205,210, Cl. 219-10.810.

Salzman, Marilyn F. Shopping cart child seat. 4,204,695, Cl. 280-33.99B.

Samuels, Peter B.; and Wood, Ernest. Arterial graft and package. 4,204,526, Cl. 128-1.00R.

Sandine, William E.; and Vedamuthu, Ebenezer R., to Microlife Technics, Inc. Lyophilization of bacteria. 4,205,132, Cl. 435-260.000.

Sanraku-Ocean Co., Ltd.: *See—*
Mori, Shunro; Okamoto, Rokuro; Inui, Taiji; and Takeuchi, Tomio, 4,205,163, Cl. 536-17.00R.

Santerre, David. Variable wheelbase road truck. 4,204,697, Cl. 280-80.00B.

Sanzharovsky, Alexandr T.: *See—*
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Sapin, Joel: *See—*
Hennart, Claude; Rabussier, Bernard; Mandon, Jean-Pierre; and Sapin, Joel, 4,205,066, Cl. 424-84.000.

Sarantakis, Dimitrios, to American Home Products Corporation. Somatostatin analogues. 4,204,990, Cl. 260-112.50S.

Saroy Engineering: *See—*
Husted, Royce H., 4,204,581, Cl. 180-190.000.

Sartorius Membranfilter GmbH: *See—*
Weickhardt, Ludwig, 4,204,957, Cl. 210-98.000.

Sasaki, Kanemichi: *See—*
Sakamoto, Koji; Asano, Takeshi; Mizuochi, Kazuo; and Sasaki, Kanemichi, 4,205,081, Cl. 424-279.000.

Sasaki, Shoji: *See—*
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Sassin, Roger L.: *See—*
Hall Jr., Harleston J.; Sassin, Roger L.; and Yuhas, Drew J., 4,204,681, Cl. 273-73.00C.

Satama, Kauko K. Air conditioning apparatus and system. 4,204,409, Cl. 62-271.000.

Sato, Reisuke: *See—*
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,353, Cl. 360-61.000.

Satoh, Katsuhiko: *See—*
Asano, Kazuhiro; Ueda, Makoto; Torisawa, Akira; Shida, Masaharu; Satoh, Katsuhiko; and Mandai, Masaaki, 4,204,397, Cl. 368-202.000.

Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, to Warner-Lambert Company. 3-Pyrrolin-2-one derivatives. 4,205,078, Cl. 424-274.000.

Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, to Shikoku Chemicals Corporation. Novel imidazole-isocyanuric acid adducts and utilization thereof. 4,205,156, Cl. 528-117.000.

Sawai, Masahide: *See—*
Kakizaki, Takehiro; Tagawa, Susumu; and Sawai, Masahide, 4,205,253, Cl. 313-437.000.

Sawamura, Osamu: *See—*
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Sawaya, Showhachi: *See—*
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Masumoto, Hakaru; and Sawaya, Showhachi, 4,204,888, Cl. 148-31.000.

Scarato, Armand: *See—*
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Scarborough, W. Bertram: *See—*
Piehl, Robert L.; and Scarborough, W. Bertram, 4,205,050, Cl. 423-228.000.

Schaefer Equipment Incorporated: *See—*
Cale, Roland E., 4,204,419, Cl. 72-356.000.

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Sherlock, Margaret H.; and Long, James F., 4,205,073, Cl. 424-266.000.

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Schmid, Norbert: *See—*
Schonwald, Siegfried; and Schmid, Norbert, 4,204,802, Cl. 415-213.00T.
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Loane, Charles M., Jr.; and Hoss, Martin L., 4,204,864, Cl. 75-257.000.
McGinniss, Vincent D.; and Stevenson, Donald R., 4,204,932, Cl. 204-181.00R.
Scott, Edward S. Dental post. 4,204,321, Cl. 433-177.000.
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Kmetz, Edward R.; and Joumas, George E., 4,204,833, Cl. 431-22.000.
Scragg, Edgar P. Fluid flow control valve. 4,204,557, Cl. 137-244.000.
Scrymgeour, Thomas C.: *See—*
Barber, Donald T.; and Scrymgeour, Thomas C., 4,204,639, Cl. 235-462.000.
Sealed Power Corporation: *See—*
Davis, M. Lewis, 4,204,688, Cl. 277-9.000.
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Nakagawa, Tadashi; Koyama, Mitsuo; and Nemoto, Ichiro, 4,204,763, Cl. 354-267.000.
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Serck Industries Limited: *See—*
Tooker, Philip G., 4,204,312, Cl. 29-523.000.
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N'Guyen, Van L., 4,204,768, Cl. 356-243.000.
Serlin, Richard A.; and Field, Thomas A., to Alloying Surfaces, Inc.; and Serlin, Richard A. Surface alloying apparatus including safety circuit. 4,205,211, Cl. 219-76.130.
Sevaldsen, Flemming: *See—*
Braad, Poul E.; Jensen, Knud B.; Rosendal, Hans; and Sevaldsen, Flemming, 4,204,415, Cl. 72-52.000.
Severn, Clare F. Instructional apparatus for stringed instrument. 4,204,454, Cl. 84-315.000.
Seward, DeWitt C., III. Airship control system. 4,204,656, Cl. 244-30.000.
Seymour, Samuel L., to PPG Industries, Inc. Glass sheet alignment means and method of using. 4,204,853, Cl. 65-106.000.
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Conti, Mario; Chiavarotti, Gian P.; and Luciani, Sandro, 4,205,332, Cl. 357-34.000.
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Shah, Niranjan S.; and Taylor, James F., to NCR Corporation. System and method for accessing memory connected to different bus and requesting subsystem. 4,205,373, Cl. 364-200.000.
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Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.
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Carr, John B., 4,205,080, Cl. 424-275.000.
Durham, Harry G.; and Carr, John B., 4,205,076, Cl. 424-270.000.
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Shepherd, Robert G., to American Cyanamid Company. Hypolipidemic and antiatherosclerotic 4-(polyfluoroalkylamino)phenyl compounds. 4,205,085, Cl. 424-309.000.
Sheppard, William L., to AVM Corporation. Vacuum system. 4,204,812, Cl. 417-395.000.
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Kyung, Jai H.; and Richards, Harvey J., 4,205,048, Cl. 423-24.000.
Sherliker, Francis R.: *See—*
Barlow, William A.; Rhodes, Maurice; Sherliker, Francis R.; and Williams, Edward W., 4,204,933, Cl. 204-181.00N.
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Ishimatsu, Yoshiaki; Shigesada, Shigeki; Suzuki, Hiroyasu; Kitagawa, Hironoshin; and Kimura, Shoji, 4,205,128, Cl. 435-182.000.

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Irie, Toshio; Matsumura, Ko; Nakamura, Hiroto; Shimanaka, Hiroshi; and Suzuki, Toshio, 4,204,890, Cl. 148-111.000.

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Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

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Bentele, Benedikt; and Hecht, Gert, 4,204,800, Cl. 415-53.00T.
Erche, Manfred; Filberich, Ludwig; Pove, Dusan; Waldmann, Hermann; and Weibelzahl, Manfred, 4,205,368, Cl. 363-35.000.
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Smith International, Inc.: *See*—
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Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,205,071, Cl. 424-244.000.
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Smith, Otto J. M. Heated piping system for fusible salt heat exchange fluid in a solar power plant. 4,204,407, Cl. 60-641.000.
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Nicholson, Richard R.; Smith, Ray E.; and Shukla, Jayendra G., 4,205,022, Cl. 260-953.000.
Smith, Richard D., to Kennecott Copper Corporation. Tarnish resistant copper alloy. 4,204,883, Cl. 148-2.000.
Smith, Robert E.: *See*—
Davis, Frank E., 4,204,596, Cl. 206-203.000.
Smith, Ronald J.; and Gonzalez, Manuel A., to Olin Corporation. Water injection for control of fines for producing defluorinated phosphate rock granules. 4,205,049, Cl. 423-167.000.
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Hodgson, Thomas D.; Carley-Macauly, Kenneth W.; and Smith, Sidney, 4,204,953, Cl. 210-58.000.
Smyser, Craig: *See*—
Hobbs, Jim F.; and Smyser, Craig, 4,204,979, Cl. 252-416.000.
Snell, John B., to Minnesota Mining and Manufacturing Company. Double grooved welding backup. 4,205,219, Cl. 219-160.000.
Snyder, Lloyd R., to Technicon Instruments Corporation. Chromatographic apparatus and method. 4,204,952, Cl. 210-31.00C.
Societe Anonyme D.B.A.: *See*—
Kervagoret, Gilbert, 4,204,817, Cl. 418-248.000.
Societe Anonyme Dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Poinas, Christian, 4,205,277, Cl. 331-12.000.
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Thuries, Edmond; Raynaud, Bernard; and Scarato, Armand, 4,205,209, Cl. 200-163.000.
Societe Anonyme dite: Ets Bonduelle a Renescure: *See*—
Spinoglio, Mario, 4,204,386, Cl. 56-14.400.
Societe Anonyme Francaise du Ferodo: *See*—
Jeanson, Rene H., 4,204,411, Cl. 64-2.00P.
Societe B.M. Costamagna: *See*—
Feuillade, Jean-Louis J., 4,204,660, Cl. 249-86.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Le Viet, Toai, 4,204,336, Cl. 34-5.000.
Societe Generale pour le Financement de l'Innovation, Soginnove: *See*—
Cailliot, Serge, 4,204,964, Cl. 210-370.000.
Societe Industrielle Bertrand Faure: *See*—
Courtois, Bernard, 4,204,658, Cl. 248-430.000.
Societe Normande de Services: *See*—
Cailliot, Serge, 4,204,964, Cl. 210-370.000.
Soda, Takashi: *See*—
Eishima, Tetsusuke; Ikariyama, Takehiro; Jinnouchi, Raizo; Oyagi, Kunioki; and Soda, Takashi, 4,205,206, Cl. 179-124.000.
Sogitec: *See*—
Game, Jacques-Marie N.; and Tiesse, Bernard A., 4,204,751, Cl. 352-17.000.
Sokolov, Anatoly D.: *See*—
Menshutin, Vasily P.; Akutin, Modest S.; Iovdalsky, Nikolai V.; Minakova, Alla N.; Zherebtsov, Evgeny R.; Sokolov, Anatoly D.; Abramov, Vsevolod V.; Melekhova, Galina D.; and Ustkachkintsev, Alexandr N., 4,205,030, Cl. 264-40.100.
Solarspan, Inc.: *See*—
Mattson, John P., 4,204,521, Cl. 126-446.000.
Solod, Vladimir S.: *See*—
Chumanov, Julian M.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Pogorzhelsky, Viktor I.; Morozov, Vasily P.; Levichev, Pavel A.; Lyashenko, Jury P.; Shalimov, Anatoly G.; Evteev, Dmitry P.; Efimenko, Sergei P.; Ignatiev, Stanislav N.; Slednev, Vladimir P.; Ovsy, Eduard V.; Solod, Vladimir S.; and Moiseenkov, Valery V., 4,204,416, Cl. 72-204.000.
Solvay & Cie: *See*—
Niccolini, Giuseppe, 4,204,941, Cl. 204-296.000.
Somar Manufacturing Co., Ltd.: *See*—
Nagasawa, Kohtaro; Ogitani, Osamu; and Fujii, Ryuichi, 4,205,018, Cl. 525-404.000.
Sommerfeld, Rolf: *See*—
Romey, Ingo; Schlutter, Aloys; and Sommerfeld, Rolf, 4,204,986, Cl. 260-28.5AS.
Sony Corporation: *See*—
Kakizaki, Takehiro; Tagawa, Susumu; and Sawai, Masahide, 4,205,253, Cl. 313-437.000.
Kutaragi, Ken, 4,205,311, Cl. 340-784.000.
Nagumo, Fumio, 4,205,336, Cl. 358-43.000.
Tsukada, Keizo, 4,205,274, Cl. 330-276.000.
Yoshida, Tadao, 4,205,273, Cl. 330-251.000.
Sortex North America, Inc.: *See*—
Burford, Henry H. T., Jr., 4,204,950, Cl. 209-558.000.
Southwire Company: *See*—
Bonnamour, Yves B., 4,204,568, Cl. 164-87.000.
Spaida, Hans-Peter: *See*—
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.
Spaziante, Placido M.: *See*—
Bianchi, Giuseppe; deNora, Oronzio; and Spaziante, Placido M., 4,204,937, Cl. 204-219.000.
Speer, John, Sr. Dual-tread exerciser. 4,204,673, Cl. 272-69.000.
Speer, Spencer J., to General Dynamics Corporation Pomona Division. Mixing device for simultaneously dispensing two-part liquid compounds from packaging kit. 4,204,775, Cl. 366-336.000.
Sperry Rand Corporation: *See*—
Barton, Lester C.; Butler, Gene R.; and Butler, L. Dennis, 4,204,791, Cl. 414-36.000.
Wynn, Edward J.; and Bryant, Cal L., 4,204,792, Cl. 414-36.000.
Spinoglio, Mario, to Societe Anonyme dite: Ets Bonduelle a Renescure. Machine for cutting and gathering vegetables. 4,204,386, Cl. 56-14.400.
Spiro, John M.: *See*—
Lincicome, Thomas N.; Spiro, John M.; and Brons, Albert J., 4,204,707, Cl. 285-114.000.
Spits, Raymond; and Beck, Hans W. Automatic sizing system for numerically controlled machine. 4,204,782, Cl. 408-3.000.
Sprague Electric Company: *See*—
Jones, Leith; and McGrath, N. Christian, 4,205,099, Cl. 427-90.000.
Randall, John J., Jr.; and Bernard, Walter J., 4,204,919, Cl. 204-29.000.
Sprecker, Mark A.; Kryschuk, John J.; and Hall, John B., to International Flavors & Fragrances Inc. Process for preparing substituted oxyacetaldehydes and acetals thereof. 4,205,186, Cl. 568-600.000.
Springer, Helmut: *See*—
Weber, Jurgen; and Springer, Helmut, 4,205,013, Cl. 568-451.000.
Staats, Henry N., to General Binding Corporation. Heat reactivatible adhesive book binding. 4,204,704, Cl. 281-21.00R.
Stables, Harry C.; and Briggs, Kenneth, to Glaxo Group Limited. Processing of cephalosporin C. 4,205,165, Cl. 544-20.000.
Stadler, Istvan: *See*—
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.
Staebler, David L., to RCA Corporation. Laser beam apparatus and method for analyzing solar cells. 4,205,265, Cl. 324-158.00D.
Stahl, Stig: *See*—
Wicksell, Hans A.; Stahl, Stig; and Lofstedt, Ingemar G., 4,204,693, Cl. 280-809.00T.
Stalder, John L., to Conoco, Inc. Low shear polymer injection method with ratio control between wells. 4,204,574, Cl. 166-305.00R.
Stalwart Rubber Company, The: *See*—
Hall, Harold E., 4,204,741, Cl. 339-200.00P.
Stamicarbon, B.V.: *See*—
Jongsma, Cornelis, 4,205,184, Cl. 562-494.000.
Stammbach, Christian: *See*—
Schatz, Franz; Stammbach, Christian; Thiele, Kurt; Wagner-Jauregg, Theodor W.; Zirngibl, Ludwig; Fischer, Johanna; and Jahn, Ulrich, 4,204,998, Cl. 260-326.150.
Standard Oil Company (Indiana): *See*—
Lee, Richard J.; and Harris, Samuel W., 4,204,970, Cl. 252-51.50A.
Stanley Electric Co., Ltd.: *See*—
Kobayashi, Shuji; Aoyagi, Mitsuo; Kanno, Tominori; Ueno, Kazuei; and Nomura, Shin-ichi, 4,205,098, Cl. 427-76.000.
Stanley Hayman and Company: *See*—
Hayman, Richard W., 4,204,636, Cl. 235-383.000.
Stark, Herbert: *See*—
Kuffner, Karl; Lassig, Wolfgang; Meier, Ernst; Boie, Immo; Kirchhoff, Gertrud; Haseler, Helmut; and Stark, Herbert, 4,204,867, Cl. 430-376.000.
Starr, Eugene W.: *See*—
Shields, George B.; and Starr, Eugene W., 4,204,845, Cl. 65-25.00A.
Stauffer Chemical Company: *See*—
Anzerberger, Joseph F., Sr., 4,205,023, Cl. 260-990.000.
Baker, Don R., 4,204,858, Cl. 71-111.000.
Cisco, Thomas F.; Hansen, George E.; and Agate, Robert N., 4,204,916, Cl. 203-6.000.
Coll-Palagos, Miguel, 4,204,925, Cl. 204-152.000.
Hayati, Hossein; Towers, Russell S.; and Carpenter, Peter G., deceased, 4,204,872, Cl. 106-38.350.
Herscovici, Eva J., 4,205,162, Cl. 528-499.000.
Via, Francis A., 4,204,928, Cl. 204-159.230.
Stedman, Robert N., to Caterpillar Tractor Co. Ground-engaging implement assembly. 4,204,578, Cl. 172-307.000.
Steigerwald Strahltechnik GmbH: *See*—
Schubert, Gernot, 4,205,118, Cl. 428-594.000.
Stein, Larry: *See*—
Beluzzi, James D.; McGregor, William H.; and Stein, Larry, 4,205,069, Cl. 424-177.000.
Steiner, Jack, to Centrodyne Corporation. Taximeter. 4,205,388, Cl. 364-900.000.
Stenograph Corporation: *See*—
Michals, Richard A., 4,205,351, Cl. 360-4.000.
Stepanova, Nadezhda M.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva,

Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Sterling Drug Inc.: *See*—
Albertson, Noel F., 4,205,171, Cl. 546-97.000.
Elton, Michael J.; Jackson, Arthur; and Harrison, John W., 4,205,185, Cl. 562-444.000.
Szalavitz, Miklos, 4,204,875, Cl. 106-87.000.

Sternberg, James C.; and Lillig, John E., to Beckman Instruments, Inc. Method of rate immunonephelometric analysis. 4,204,837, Cl. 23-230.00B.

Stevens, Henry C., to PPG Industries, Inc. Triallyl carbonate polymers. 4,205,154, Cl. 526-314.000.

Stevenson, Donald R.: *See*—
McGinniss, Vincent D.; and Stevenson, Donald R., 4,204,932, Cl. 204-181.00R.

Stewart, David G.: *See*—
Gane, Brian R.; and Stewart, David G., 4,205,190, Cl. 568-902.000.

Stiles, Nathan; and Heininger, Richard T., to Gem Industries Inc. Spring support. 4,204,286, Cl. 5-11.000.

Stokeley-Van Camp, Inc.: *See*—
Babayan, Vigen K., 4,205,086, Cl. 424-312.000.

Strampfer, Armin: *See*—
Moser, Theo; Andra Rolf; Rittler, Roland; and Strampfer, Armin, 4,204,951, Cl. 209-625.000.

Strauch, Raymond, to Telecommunications Radioelectriques et Telephoniques T.R.T. Device for measuring the range of a moving target and the speed at which it approaches or recedes. 4,205,314, Cl. 343-9.00R.

Streetman, William E.; and Daftary, Shashikumar H., to American Cyanamid Company. Process for melt-spinning acrylonitrile polymer fiber. 4,205,039, Cl. 264-206.000.

Streets, Roger L.; Rabito, Thomas G.; and Von Kamp, John, to Goodyear Tire & Rubber Company, The. Aqueous polyester dispersion for adhering vinyl film to wood. 4,204,987, Cl. 260-29.20E.

Strobel, Rudolf G. K., to Procter & Gamble Company, The. Continuous desorption apparatus for aroma flavor concentrate. 4,204,464, Cl. 99-286.000.

Stromberg, Thore. Wasteless connecting valves. 4,204,661, Cl. 251-95.000.

Stubblefield, Thomas W., to Electric Power Research Institute, Inc. Vaporization cooled electrical inductive apparatus. 4,205,289, Cl. 336-57.000.

Stubbs, Raymond F., to Pretron Electronics Pty. Ltd. Solid materials flow rate measurement. 4,205,230, Cl. 250-356.000.

Sturm, Waldemar: *See*—
Ritter, Ernst; Schwartz, Reinhard; Muuller, Rolf; Sturm, Waldemar; and Faupel, Werner, 4,204,510, Cl. 123-179.00L.

Sudarikov, Vasily L.: *See*—
Khutoretsky, Garri M.; Fridman, Vladimir M.; Zagorodnaya, Galina A.; Vorontsov, Alexandr I.; Ignatiev, Anatoly D.; and Sudarikov, Vasily L., 4,204,313, Cl. 29-596.000.

Suga, Michihisa: *See*—
Tsuzuki, Mitsuo; and Suga, Michihisa, 4,205,322, Cl. 346-153.000.

Sugahara, Yujiro; Naito, Hiroyuki; Takai, Kiyoshi; and Kondo, Tatuya, to Mizusawa Kagaku Kogyo Kabushiki Kaisha. Process for recovery of nitric acid from nitrates. 4,205,054, Cl. 423-390.000.

Suganuma, Hisashi: *See*—
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,353, Cl. 360-61.000.

Sugiyama, Masaaki; and Yuda, Takuo, to Yamakawa Industry Company Ltd.; and Nifco Inc. Combination strainer and suction inlet pipe. 4,204,960, Cl. 210-232.000.

Sullivan, Richard N., to Precision Plumbing Products, Inc. Self-contained, automatic primer valve for sewer line drain traps. 4,204,556, Cl. 137-206.000.

Sullivan, Sheryl S.: *See*—
Wu, Tai-Wing; and Sullivan, Sheryl S., 4,204,839, Cl. 23-230.00B.

Sulzer Morat GmbH: *See*—
Vinnemann, Antonius; Elsasser, Heinrich; Walter, Manfred; and Gaiser, Willi, 4,204,414, Cl. 66-145.00R.

Sumitamo Naugatuck Co., Ltd.: *See*—
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,205,019, Cl. 525-243.000.

Sumitomo Chemical Company, Limited: *See*—
Fukami, Kousuke; Fujimoto, Masanori; Fujita, Fumio; and Nagase, Tsuneyuki, 4,205,218, Cl. 219-145.230.
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Hideo, 4,205,148, Cl. 525-379.000.

Sumiyoshi Denki Kabushiki Kaisha: *See*—
Matsugo, Ryuzo, 4,204,764, Cl. 354-298.000.

Sun Chemical Corporation: *See*—
Johnson, Mark U.; Rothmayer, Jules; and Smith, Hugh M., 4,204,871, Cl. 106-20.000.

Suys, Andre R.: *See*—
Van Landeghem, Willy K.; and Suys, Andre R., 4,205,116, Cl. 428-409.000.

Suzuki, Hiroyasu: *See*—
Ishimatsu, Yoshiaki; Shigesada, Shigeki; Suzuki, Hiroyasu; Kitagawa, Hironoshin; and Kimura, Shoji, 4,205,128, Cl. 435-182.000.

Suzuki, Katsumi: *See*—
Izumi, Yusuke; Maekawa, Junji; and Suzuki, Katsumi, 4,205,182, Cl. 560-247.000.

Suzuki, Takao; Komatsu, Yoshimasa; Takeda, Akimichi; and Baba, Toshihiko, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Steel Corporation. Apparatus for machining flash and upset material formed in flash welding operation. 4,205,214, Cl. 219-97.000.

Suzuki, Toshihiro: *See*—
Sawa, Natsuo; Nomoto, Tadao; Iuchi, Keiko; Suzuki, Toshihiro; and Kawata, Shunichi, 4,205,156, Cl. 528-117.000.

Suzuki, Toshio: *See*—
Irie, Toshio; Matsumura, Ko; Nakamura, Hiroto; Shimanaka, Hiroshi; and Suzuki, Toshio, 4,204,890, Cl. 148-111.000.

Suzuki, Yujiro; Shimiya, Keiji; and Miyagawa, Takashi, to Kasei Optonix, Ltd. Intensifying screens. 4,205,234, Cl. 250-483.000.

Suzuki, Yutaka: *See*—
Takahashi, Takehiko; and Suzuki, Yutaka, 4,205,051, Cl. 423-266.000.

Svatikov, Jury N.: *See*—
Poddubny, Isaak Y.; Averyanov, Sergei V.; Averyanova, Lidia A.; Grinblat, Mark P.; Safin, Rinat R.; Breger, Alexandr K.; Goldin, Vladimir A.; Branzburg, Elena Z.; Kondratovsky, Viktor S.; Kabirov, Albert G.; Sanzharovsky, Alexandr T.; Shtukareva, Valeria B.; Svatikov, Jury N.; and Stepanova, Nadezhda M., 4,205,026, Cl. 264-22.000.

Sven Tveter: *See*—
Reed, Steven P.; and Kinkead, Jordan A., 4,204,618, Cl. 225-106.000.

Swarthout, E. Jack; and Antholz, Phillip, to Illinois Cereal Mills. Absorbent polymeric compositions derived from amylaceous material-formaldehyde substrates. 4,204,983, Cl. 260-17.4GC.

Sweeney, Roy O.: *See*—
Lane, Manning; Hauck, Warren J.; and Sweeney, Roy O., 4,204,287, Cl. 5-18.00R.

Syed, Ali N.: *See*—
Khalil, Ezzat N.; and Syed, Ali N., 4,205,063, Cl. 424-70.000.

Sykes, Richard B.; Wells, J. Scott; Principe, Pacifico A.; and Liu, Wen C., to E. R. Squibb & Sons, Inc. β-Lactamase inhibitor EM4615. 4,205,068, Cl. 424-117.000.

System Schultheis GmbH & Co.: *See*—
Rohrscheid, Karl, 4,204,797, Cl. 414-458.000.

Szalavitz, Miklos, to Sterling Drug Inc. Cementitious compositions. 4,204,875, Cl. 106-87.000.

Szantay, Csaba: *See*—
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.

Szekely, Istvan: *See*—
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, 4,204,999, Cl. 260-340.300.

Szeliga, Phillip C.: *See*—
Schrader, Joseph F.; and Szeliga, Phillip C., 4,204,612, Cl. 222-40.000.

Tabata, Junichi: *See*—
Hamada, Shinji; Hoshino, Fumio; and Tabata, Junichi, 4,204,736, Cl. 355-118.000.

Tabor, Donald R. Roofing material handling and sealing machine. 4,204,904, Cl. 156-497.000.

Tadanier, John S.; Dunnigan, Daniel A.; Freiberg, Leslie A.; and Martin, Jerry R., to Abbott Laboratories. 6'N-Alkyl- and 6',6'-di-N-alkyl derivatives of fortimicins A and B. 4,205,070, Cl. 424-180.000.

Tagawa, Susumu: *See*—
Kakizaki, Takehiro; Tagawa, Susumu; and Sawai, Masahide, 4,205,253, Cl. 313-437.000.

Taig, Alistair G., to Bendix Corporation, The. Fluid control means. 4,204,554, Cl. 137-101.000.

Takahashi, Atsushi: *See*—
Mizuguchi, Ryuzo; Takahashi, Atsushi; Ishikura, Shin-ichi; and Uenaka, Akimitsu, 4,205,152, Cl. 526-265.000.

Takahashi, Takehiko; and Suzuki, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Stabilized zirconia for oxygen ion-conductive solid electrolyte. 4,205,051, Cl. 423-266.000.

Takai, Kiyoshi: *See*—
Sugahara, Yujiro; Naito, Hiroyuki; Takai, Kiyoshi; and Kondo, Tatuya, 4,205,054, Cl. 423-390.000.

Takase, Koyu; Makino, Shigeo; and Naitou, Tadashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Break preventing gasket. 4,204,691, Cl. 277-235.00B.

Takeda, Akimichi: *See*—
Suzuki, Takao; Komatsu, Yoshimasa; Takeda, Akimichi; and Baba, Toshihiko, 4,205,214, Cl. 219-97.000.

Takeda Chemical Industries, Ltd.: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,205,180, Cl. 560-168.000.

Takekawa, Hiroshi: *See*—
Yamamoto, Tadao; Takekawa, Hiroshi; Banno, Taichi; and Koshiishi, Kiyozo, 4,204,917, Cl. 204-1.00T.

Takeuchi, Tomio: *See*—
Mori, Shunro; Okamoto, Rokuro; Inui, Taiji; and Takeuchi, Tomio, 4,205,163, Cl. 536-17.00R.

Takizawa, Masaaki; and Sasaki, Shoji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Radial turbines. 4,204,807, Cl. 416-188.000.

Tallent, Glen, Jr.: *See*—
Corron, Donald C.; and Tallent, Glen, Jr., 4,204,301, Cl. 28-248.000.
Tallis, Thomas J., to Clark Equipment Company. Corner tooth construction. 4,204,349, Cl. 37-141.0RS.
Tamm, Rolf; Tomoff, Toma; and Huber, Bernhard, to Bodenseewerk Perkin-Elmer & Co. GmbH. Automatic liquid flow sampling apparatus. 4,204,430, Cl. 73-423.00A.
Tanaka, Fumio; and Toshimitsu, Naohiko, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Erasing head. 4,205,356, Cl. 360-118.000.
Tanaka, Hiroshi: *See*—
Yamamoto, Yoshihiro; Sakurai, Kenji; and Tanaka, Hiroshi, 4,204,873, Cl. 106-43.000.
Tanaka, Kiyoshi: *See*—
Shiozaki, Morio; Okamoto, Masafumi; Tanaka, Kiyoshi; and Shimazu, Takahide, 4,204,891, Cl. 148-111.000.
Tanaka, Kunihiko: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Hemmi, Keiji, 4,205,166, Cl. 544-27.000.
Tanaka, Shinta, to Iseki Agricultural Machinery Mfg. Co., Ltd. Control means for hydraulic clutches. 4,204,590, Cl. 192-99.00R.
Tani, Mitsuhiro; and Watanabe, Hideo, to Iseki Agricultural Machinery Mfg. Co., Ltd. Control means for hydraulic clutches. 4,204,591, Cl. 192-99.00R.
Tanner, David E.: *See*—
Johnson, Evan R.; and Tanner, David E., 4,204,558, Cl. 137-315.000.
Tanton, George A.: *See*—
Meyer, Harry C.; Tanton, George A.; Greenberg, Raymond I.; and Williams, Joe E., 4,204,926, Cl. 204-157.10H.
Tashkentsky Nauchnoissledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt": *See*—
Nudelman, Boris I.; Bikbau, Marsel Y.; Oborin, Pavel A.; and Kuznetsova, Tamara V., 4,204,878, Cl. 106-104.000.
Tates, Donald W., to Xerox Corporation. Multimode reproducing apparatus. 4,204,727, Cl. 355-3.00R.
Tatsukami, Yoshiharu; Nishibara, Hazime; Kobayashi, Yasutoshi; and Shinonaga, Hideo, to Sumitomo Chemical Company, Ltd. Dyeable polyolefin composition. 4,205,148, Cl. 525-379.000.
Taus, Christian: *See*—
Rau, Willy; and Taus, Christian, 4,204,579, Cl. 172-657.000.
Taylor, Clyde L. Seed harvesting apparatus. 4,204,385, Cl. 56-14.300.
Taylor, James F.: *See*—
Shah, Niranjan S.; and Taylor, James F., 4,205,373, Cl. 364-200.000.
Taylor, Raymond C.: *See*—
Richards, Frank P.; and Taylor, Raymond C., 4,204,462, Cl. 93-36.50R.
Tazuma, James J.: *See*—
Gloth, Richard E.; and Tazuma, James J., 4,205,160, Cl. 528-425.000.
Techne Electronics, Ltd.: *See*—
Ho, Eugene Y.; and Musolino, Joseph A., 4,205,300, Cl. 340-65.000.
Technicon Instruments Corporation: *See*—
Snyder, Lloyd R., 4,204,952, Cl. 210-31.00C.
Tecnimont S.p.A.: *See*—
Gramatica, Giorgio, 4,205,044, Cl. 422-191.000.
Tecumseh Products Company: *See*—
Wise, Kennard L.; and Schroeder, George H., 4,205,246, Cl. 310-68.00C.
Teichmann, Manfred: *See*—
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.
Teijin Limited: *See*—
Nose, Kenkichi; and Mikumo, Toshihumi, 4,204,653, Cl. 242-178.000.
Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,204,930, Cl. 204-180.00P.
Tektronix, Inc.: *See*—
Rayner, Bruce L., 4,205,344, Cl. 358-160.000.
Tele-Alarm, Nachrichtentechnische Gerate GmbH, Herstellungs-und Vertriebsgesellschaft & Co. KG: *See*—
Hofmann, Otto; and Nagler, Georg, 4,204,635, Cl. 235-382.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Strauch, Raymond, 4,205,314, Cl. 343-9.00R.
Telediffusion de France: *See*—
Pujolle, Jean; and Bourcet, Patrice, 4,204,432, Cl. 73-599.000.
Teraji, Tsutomu: *See*—
Kamiya, Takashi; Tanaka, Kunihiko; Teraji, Tsutomu; and Hemmi, Keiji, 4,205,166, Cl. 544-27.000.
Termanini, Zafer A., to Zafmedico Corp. Method and apparatus for fiber-optic intravascular endoscopy. 4,204,528, Cl. 128-6.000.
Terzian, Rouben T.; Montague, Douglas P.; and Morrison, Howard J., to Marvin Glass & Associates. Liquid cooling and dispensing device. 4,204,613, Cl. 222-146.00C.
Tessier, Jean: *See*—
Martel, Jacques; and Tessier, Jean, 4,205,008, Cl. 260-456.00R.
Teves, Alfred: *See*—
Knoblauch, Wolfgang; and von Werner, Konrad, 4,204,972, Cl. 252-78.100.
Texaco Inc.: *See*—
Biasotti, Joseph B.; Dorn, Peter; Herbstman, Sheldon; and Dille, Kenneth L., 4,204,841, Cl. 44-71.000.
Texas Instruments Incorporated: *See*—
Reed, Bruce S., 4,205,227, Cl. 250-330.000.
Textron Inc.: *See*—
Kirrish, Hail; and McCauley, Jon R., 4,204,566, Cl. 151-38.000.
Therma-Plex: *See*—
Wyner, Jay S., 4,204,495, Cl. 118-300.000.
Thiele, Dietrich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method and apparatus for encapsulating radioactively contaminated lumps or granular material in metal. 4,204,975, Cl. 252-301.10W.
Thiele, Kurt: *See*—
Schatz, Franz; Stammbach, Christian; Thiele, Kurt; Wagner-Jauregg, Theodor W.; Zirngibl, Ludwig; Fischer, Johanna; and Jahn, Ulrich, 4,204,998, Cl. 260-326.150.
Thies, Peter W., to Kali-Chemie Aktiengesellschaft. Cyclopentapyrans. 4,205,083, Cl. 424-283.000.
Thomas, Robert E. Security display rack. 4,204,601, Cl. 211-4.000.
Thomin, Guy: *See*—
Bridoux, Edouard; Bruneel, Christian; Haine, Francis; and Thomin, Guy, 4,204,435, Cl. 73-626.000.
Thompson, Paige W., to General Electric Company. Method of closing a capillary tube. 4,204,378, Cl. 53-403.000.
Thomson-CSF: *See*—
Micheron, Francois; Bruneel, Jean L.; and Leclerc, Pierre, 4,205,242, Cl. 307-400.000.
Thomson-CSF Laboratories, Inc.: *See*—
McMann, Renville H., Jr.; and Bakach, Joseph, 4,205,310, Cl. 340-750.000.
Thralls, Don J. W.: *See*—
Blum, Julian J.; and Thralls, Don J. W., 4,204,706, Cl. 283-21.000.
Thubeauville, Heinz, to Dr. C. Otto & Comp. G.m.b.H. Tubular apparatus for conducting gases. 4,205,047, Cl. 422-242.000.
Thuries, Edmond; Raynaud, Bernard; and Scarato, Armand, to Societe Anonyme Dite: Delle-Alsthom. Articulated contact finger. 4,205,209, Cl. 200-163.000.
Tiesse, Bernard A.: *See*—
Game, Jacques-Marie N.; and Tiesse, Bernard A., 4,204,751, Cl. 352-17.000.
Tillotson, Henry B., to Toro Company, The. Electrical connector retaining device. 4,204,738, Cl. 339-75.00P.
Timmerbeil, Karl E., to Weka-Handelsgesellschaft m.b.H. Banding machine, in particular for banding bundles of bank notes. 4,204,381, Cl. 53-528.000.
Tingwall, Rolf: *See*—
Berg, Erik E.; and Tingwall, Rolf, 4,204,884, Cl. 148-2.000.
Tirtiaux, Florent: *See*—
Pike, Marshall; Barr, Iain G.; and Tirtiaux, Florent, 4,205,095, Cl. 426-607.000.
Toba, Hirotaka: *See*—
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.
Tokheim Corporation: *See*—
Vogel, John D., 4,204,810, Cl. 417-244.000.
Tokitoh, Hirohiko: *See*—
Kato, Yutaka; Tokitoh, Hirohiko; Kitahara, Tomohiro; and Ito, Hiromi, 4,204,767, Cl. 356-444.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hamanaka, Kunio; and Sakurai, Yoshiki, 4,205,355, Cl. 360-99.000.
Inoue, Yuichiro; and Sakaki, Masamichi, 4,204,422, Cl. 73-4.00R.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Inouye, Tamon; and Mizutani, Hiroyuki, 4,205,375, Cl. 364-414.000.
Kawagai, Kenji; and Yoshida, Shigeki, 4,205,263, Cl. 323-22.00R.
Tom McGuane Industries, Inc.: *See*—
Ludwig, George C., 4,204,561, Cl. 137-510.000.
Tomada, Franco, to Ing. C. Olivetti & C., S.p.A. Device for encoding and recording information with peak shift compensation. 4,205,352, Cl. 360-45.000.
Tomita, Yoshifumi, to Hitachi, Ltd. Color cathode ray tube with reflective layers having apices centered between matrix windows. 4,205,255, Cl. 313-470.000.
Tomoff, Toma, to Bodenseewerk Perkin-Elmer & Co., GmbH. Graphite furnace bore temperature measurements in flameless atomic absorption spectroscopy. 4,204,770, Cl. 356-312.000.
Tomoff, Toma: *See*—
Tamm, Rolf; Tomoff, Toma; and Huber, Bernhard, 4,204,430, Cl. 73-423.00A.
Tomosada, Masahiro: *See*—
Goshima, Yoshitomo; Kawakubo, Kazuo; Furuichi, Katsushi; Sakamaki, Hisashi; Sawamura, Osamu; Komiya, Yutaka; and Tomosada, Masahiro, 4,204,728, Cl. 355-4.000.
Tomoskozi, Istvan; Kovacs, Gabor; Szekely, Istvan; Simonidesz, Vilmos; Lovasz nee Gaspar, Marianna; Keresztes nee Ordog; Remport nee Radoczi, Julia; Stadler, Istvan; Visky nee Gombos, Zsuzsa; and Szantay, Csaba, to Chinoin Gyogyszes es Begyeszeti Termekek Gyara Rt. Process for making bicyclic lactone derivatives for use as intermediates in the synthesis of prostaglandins. 4,204,999, Cl. 260-340.300.
Tompsett, Alan J.: *See*—
Parker, David G.; and Tompsett, Alan J., 4,205,012, Cl. 260-583.00J.
Toncelli, Marcello. Slab forming conveying line. 4,204,820, Cl. 425-89.000.

Tooker, Philip G., to Serck Industries Limited. Method and apparatus for joining a tubular element to a support. 4,204,312, Cl. 29-523.000.
Torgersen, Lars: *See*—
Almqvist, Kent R.; Christensen, Jan A.; Alfheim, Roar L.; and Torgersen, Lars, 4,205,031, Cl. 264-40.400.
Torisawa, Akira: *See*—
Asano, Kazuhiro; Ueda, Makoto; Torisawa, Akira; Shida, Masaharu; Satoh, Katsuhiko; and Mandai, Masaaki, 4,204,397, Cl. 368-202.000.
Tornay, Edmund G., to Energy Transportation Group, Incorporated. LNG Pump anti-slam device. 4,204,813, Cl. 417-435.000.
Toro Company, The: *See*—
Hunter, Edwin J., 4,204,642, Cl. 239-191.000.
Tillotson, Henry B., 4,204,738, Cl. 339-75.00P.
Toshimitsu, Naohiko: *See*—
Tanaka, Fumio; and Toshimitsu, Naohiko, 4,205,356, Cl. 360-118.000.
Tosswill, Christopher H., to Galileo Electro-Optics Corp. Far field imaging. 4,205,228, Cl. 250-336.000.
Towers, Russell S.: *See*—
Hayati, Hossein; Towers, Russell S.; and Carpenter, Peter G., deceased, 4,204,872, Cl. 106-38.350.
Towery, Mark W. Forced hot air fireplace attachment. 4,204,519, Cl. 126-164.000.
Toyo Soda Manufacturing Company, Ltd.: *See*—
Seita, Toru; Shimizu, Akihiko; Kato, Yoshio; and Hashimoto, Tsutomu, 4,205,134, Cl. 521-53.000.
Toyoda, Kenji; Araki, Yoshitaka; and Watanabe, Sakuji, to Nippon Kogaku K.K. Display device in an automatic exposure control camera. 4,204,755, Cl. 354-36.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Kikuchi, Makoto, 4,204,441, Cl. 82-2.500.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Harada, Toshiro; Kubo, Tadayuki; Kasuya, Kazusato; and Watanabe, Yukihiro, 4,204,482, Cl. 123-32.0EE.
Ishida, Yasuhiko, 4,204,514, Cl. 123-198.00F.
Kawai, Mitsuo; and Ono, Hironobu, 4,204,505, Cl. 123-119.0EC.
Miura, Nobuhiro, 4,204,484, Cl. 123-32.0SP.
Onishi, Sigeru, 4,204,488, Cl. 123-73.00A.
Onishi, Sigeru, 4,204,489, Cl. 123-73.00A.
Otani, Hisao, 4,204,720, Cl. 308-233.000.
Takahashi, Takehiko; and Suzuki, Yutaka, 4,205,051, Cl. 423-266.000.
Takase, Koyu; Makino, Shigeo; and Naitou, Tadashi, 4,204,691, Cl. 277-235.00B.
Takizawa, Masaaki; and Sasaki, Shoji, 4,204,807, Cl. 416-188.000.
Toyoura, Hirozumi; and Saito, Masaharu. Wheeled vehicle with rotatable endless track. 4,204,583, Cl. 180-9.280.
Traister, Robert L., to Xerox Corporation. Sorter for a reproduction machine. 4,204,670, Cl. 271-287.000.
Trame, Charles E., to Everbrite Electric Signs, Inc. Method of making simulated three-dimensional stained glass objects. 4,205,036, Cl. 264-132.000.
Trio Kabushiki Kaisha: *See*—
Kumagai, Morio, 4,205,272, Cl. 455-83.000.
Troxel Manufacturing Company: *See*—
Worley, George W., 4,204,713, Cl. 297-214.000.
TRW Inc.: *See*—
Shapiro, Howard E.; and Merz, Kenneth M., 4,205,298, Cl. 338-308.000.
TRW Inc., Systems & Energy: *See*—
Fox, Marvin; Cooper, Donald L.; and Warren, Walter B., 4,205,379, Cl. 364-432.000.
Tsuboi, Masaharu; and Asaka, Urataro, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor system for a multi-cylinder engine of a motorcycle. 4,204,585, Cl. 180-219.000.
Tsuchiya, Shozo; Oshima, Akio; and Hayashi, Hideo, to Nippon Oil Co., Ltd. Resins for printing inks. 4,205,145, Cl. 525-502.000.
Tsuda, Hiroshi, to Olympus Optical Co., Ltd. Roll sheet feeding device. 4,204,621, Cl. 226-137.000.
Tsukada, Keizo, to Sony Corporation. Power amplifier circuit. 4,205,274, Cl. 330-276.000.
Tsuruoka, Masao: *See*—
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,205,010, Cl. 260-465.300.
Tsuruta, Shintaro: *See*—
Kurata, Kenzi; Fukumoto, Toshito; Yoshida, Yuji; Kusama, Masanori; and Tsuruta, Shintaro, 4,204,915, Cl. 203-2.000.
Tsutsumi, Shinya: *See*—
Yasunaga, Ryuichi; Tsutsumi, Shinya; and Kuroda, Mototsugu, 4,204,297, Cl. 15-323.000.
Tsuzuki, Mitsuo; and Suga, Michihisa, to Nippon Electric Co., Ltd. Electrostatic method of simultaneously transferring to a recording medium a toner image having different polarities. 4,205,322, Cl. 346-153.000.
Tull, Bernie D., Jr.: *See*—
Arts, Jerold F.; Owen, William L., Jr.; and Tull, Bernie D., Jr., 4,205,239, Cl. 307-328.000.
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., to Dow Chemical Company, The. Multifunctional lithium containing initiator. 4,205,016, Cl. 260-665.00R.
Turbo Resources Ltd.: *See*—
Johnson, Conrad B., 4,204,946, Cl. 208-181.000.
Turlej, Zbigniew W., to Dicon Systems Limited. Battery operated smoke detector electronics. 4,205,306, Cl. 340-629.000.
Turner, Ian D.: *See*—
Paskins, Keith N.; Redman, Duncan C.; and Turner, Ian D., 4,204,879, Cl. 106-311.000.
Tweedy of Burnley Limited: *See*—
Dawson, Peter, 4,204,408, Cl. 62-62.000.
Tyrone Hydraulics, Inc.: *See*—
Basham, Dean V., 4,204,405, Cl. 60-371.000.
Ube Industries, Ltd.: *See*—
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,205,010, Cl. 260-465.300.
Uchida, Kinya: *See*—
Aida, Ko; Uchida, Kinya; and Kawada, Izumi, 4,205,125, Cl. 435-133.000.
Uchidoi, Masanori: *See*—
Date, Nobuaki; Aizawa, Hiroshi; Uchidoi, Masanori; Shimizu, Masami; and Hashimoto, Teiji, 4,204,762, Cl. 354-242.000.
Uchiike, Yukio: *See*—
Minezaki, Hisao; Haneda, Akio; Masaki, Asanori; Hanzawa, Takeo; and Uchiike, Yukio, 4,204,648, Cl. 242-18.00A.
Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Single key preferential selection device in electronic musical instrument. 4,204,452, Cl. 84-1.010.
Uda, Taizo: *See*—
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, 4,205,010, Cl. 260-465.300.
Udagawa, Tsugio: *See*—
Araya, Takeshi; and Udagawa, Tsugio, 4,205,217, Cl. 219-124.340.
Ueda, Makoto: *See*—
Asano, Kazuhiro; Ueda, Makoto; Torisawa, Akira; Shida, Masaharu; Satoh, Katsuhiko; and Mandai, Masaaki, 4,204,397, Cl. 368-202.000.
Ueki, Yoshiharu: *See*—
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,353, Cl. 360-61.000.
Uenaka, Akimitsu: *See*—
Mizuguchi, Ryuzo; Takahashi, Atsushi; Ishikura, Shin-ichi; and Uenaka, Akimitsu, 4,205,152, Cl. 526-265.000.
Ueno, Kazuei: *See*—
Kobayashi, Shuji; Aoyagi, Mitsuo; Kanno, Tominori; Ueno, Kazuei; and Nomura, Shin-ichi, 4,205,098, Cl. 427-76.000.
Ulb, Horst: *See*—
Jaschke, Hans; Kautz, Rudolf; Plate, Hermann; and Ulb, Horst, 4,205,107, Cl. 428-58.000.
Ullmann, Werner; Buhler, Ernst; Kilcher, Beat; Ruh, Herbert; and Sieg, Arno, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Electro-erosion machine tools and head assemblies therefor. 4,205,212, Cl. 219-69.00W.
Ulrich, Reinhard: *See*—
Johnson, Mark; and Ulrich, Reinhard, 4,204,742, Cl. 350-96.200.
Ulyanov, Gennady P.; and Maslov, Anatoly R., to Novosibirsky Institut Organicheskoi Khimii Sibirskogo Otdelenia Akademii Nauk SSR. Device for encoding and inputting to computer alphabetic and topologically represented graphic data that describes, in particular, structural formulae of chemical compounds. 4,205,391, Cl. 364-900.000.
Umemura, Sumio; Ohdan, Kyoji; Uda, Taizo; Matsuzaki, Tokuo; Hidaka, Mikio; Nakamura, Yasuo; and Tsuruoka, Masao, to Ube Industries, Ltd. Method for the catalytical production of acrylonitrile. 4,205,010, Cl. 260-465.300.
Union Carbide Corporation: *See*—
Cardenas, Jorge N.; and Reichle, Walter T., 4,205,187, Cl. 568-730.000.
Kaelin, Joseph Richard, 4,204,958, Cl. 210-178.000.
Van den Sype, Jaak S., 4,204,885, Cl. 148-12.00B.
United States Government: *See*—
Whitaker, John N., 4,205,057, Cl. 424-1.000.
United States of America
Agriculture: *See*—
Luddy, Francis E.; Hampson, James W.; Herb, Samuel F.; and Rothbart, Herbert L., 4,205,006, Cl. 260-410.700.
Wick, Emil, 4,205,133, Cl. 435-287.000.
Yokoyama, Henry; Hayman, Ernest P.; Hsu, Wan-Jean; and Poling, Stephen M., 4,204,859, Cl. 71-121.000.
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Hodes, Harvey A., 4,205,124, Cl. 430-456.000.
Army: *See*—
Buscher, David J.; and Schneider, Marvin J., 4,205,382, Cl. 364-516.000.
Donnally, William, Jr., 4,205,283, Cl. 333-165.000.
Esaki, Leo; Sai-Halasz, George A.; and Chang, Leroy L., 4,205,331, Cl. 357-30.000.
Meyer, Harry C.; Tanton, George A.; Greenberg, Raymond I.; and Williams, Joe E., 4,204,926, Cl. 204-157.10H.
Peperone, Salvador J., 4,205,316, Cl. 343-14.000.
Energy: *See*—
George, Victor E.; Haas, Roger A.; Krupke, William F.; and Schlitt, Leland G., 4,205,278, Cl. 331-94.50P.
Howell, Louis J., deceased, 4,204,882, Cl. 136-202.000.

Johnson, Evan R.; and Tanner, David E., 4,204,558, Cl. 137-315.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Beer, Reinhard. Cooled echelle grating spectrometer. 4,205,229, Cl. 250-352.000.
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Craig, Roger A.; and Pritchard, Huw O., 4,204,402, Cl. 60-39.060.
Walker, Hill M.; Sharpe, Max H.; and Simpson, William G., 4,204,899, Cl. 156-212.000.
Navy: *See*—
Bein, Thomas W., 4,204,816, Cl. 418-15.000.
Bott, John P., 4,204,552, Cl. 137-81.00A.
Fowler, Ronald J., 4,204,475, Cl. 102-262.000.
Gulick, Joseph F.; Miller, James S.; and Pue, Alan J., 4,204,655, Cl. 244-3.190.
Linfield, Wayne S., 4,204,342, Cl. 35-10.400.
Loker, W. Aleck; Bortzfield, Jon L.; Chard, Steven D.; Hall, John W.; and Meredith, John T., 4,204,589, Cl. 192-27.000.
Pal, Dharam; Huang, Kwang T.; and Smith, Maurice N., 4,205,235, Cl. 290-44.000.
Phillips, Norman S.; and Walcott, William B., 4,204,659, Cl. 248-562.000.
Pickens, George O., 4,205,394, Cl. 367-13.000.
Pryor, Cabell N., Jr., 4,205,396, Cl. 367-125.000.
Webster, Henry A., III, 4,204,895, Cl. 149-19.600.
U.S. Philips Corporation: *See*—
Albarda, Scato, 4,204,536, Cl. 128-204.220.
Etaix, Jean-Francois, 4,204,743, Cl. 350-96.200.
Gross, Ulrich, 4,204,453, Cl. 84-1.240.
Lersmacher, Bernhard; Lydtin, Hans; Schelhas, Karlheinz; and Knippenberg, Wilhelmus F., 4,204,769, Cl. 356-244.000.
Willems, Gerardus A. M., 4,205,215, Cl. 219-121.00P.
Zwep, Gerrit, 4,205,251, Cl. 313-330.000.
United States Surgical Corporation: *See*—
Green, David T., 4,204,623, Cl. 227-19.000.
United Technologies Corporation: *See*—
Games, John E.; Bitterli, William W.; and Healey, David M., 4,205,381, Cl. 364-505.000.
University of Illinois Foundation, The: *See*—
Kagan, Jacques, 4,205,000, Cl. 260-345.200.
University Patents, Inc.: *See*—
Bier, Milan, 4,204,929, Cl. 204-180.00R.
UOP Inc.: *See*—
Lincicome, Thomas N.; Spiro, John M.; and Brons, Albert J., 4,204,707, Cl. 285-114.000.
Upjohn Company, The: *See*—
Axen, Udo F., 4,205,178, Cl. 560-121.000.
Bundy, Gordon L., 4,205,179, Cl. 560-121.000.
Morozowich, Walter, 4,205,011, Cl. 260-558.00R.
Ursprung, Hans: *See*—
Hani, August; Horler, Hansulrich; and Ursprung, Hans, 4,204,586, Cl. 181-229.000.
Ushioda, Katsuyoshi; and Imaizumi, Fumio, to Idemitsu Petrochemical Co. Ltd. Shaping apparatus for tubular film. 4,204,819, Cl. 425-72.00R.
USM Corporation: *See*—
Salway-Waller, Malcolm; and Langton, Frederick H., 4,205,210, Cl. 219-10.810.
Ustkachkintsev, Alexandr N.: *See*—
Menshutin, Vasily P.; Akutin, Modest S.; Iovdalsky, Nikolai V.; Minakova, Alla N.; Zherebtsov, Evgeny R.; Sokolov, Anatoly D.; Abramov, Vsevolod V.; Melekhova, Galina D.; and Ustkachkintsev, Alexandr N., 4,205,030, Cl. 264-40.100.
Valeron Corporation, The: *See*—
Ruszala, Frederick B.; and Cook, Kenneth J., 4,205,386, Cl. 364-607.000.
Valyocsik, Ernest W.: *See*—
Rollmann, Louis D.; and Valyocsik, Ernest W., 4,205,052, Cl. 423-329.000.
Rollmann, Louis D.; and Valyocsik, Ernest W., 4,205,053, Cl. 423-329.000.
van Bierk, Victor B., to Nortron Corporation. System and method for calibration wheel alignment system sensors. 4,204,333, Cl. 33-288.000.
Van Brugge, Mathews. Pumps and syringes. 4,204,539, Cl. 128-223.000.
Van den Sype, Jaak S., to Union Carbide Corporation. Method for providing strong wire. 4,204,885, Cl. 148-12.00B.
van der Houwen, Derk; and Wilcke, Robert, to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie. Method and device for eliminating the background brightness variation of a video signal. 4,205,345, Cl. 358-168.000.
Vanderveen, John W., to Phillips Petroleum Company. Fuel burner useful for carbon black production. 4,204,831, Cl. 431-10.000.
Van Horne, William J. Edible server. 4,205,091, Cl. 426-138.000.
van Koten, Gerard: *See*—
Cohen, Murray S.; Noltes, Jan G.; and van Koten, Gerard, 4,205,191, Cl. 585-250.000.
Van Landeghem, Willy K.; and Suys, Andre R., to AGFA-GEVAERT N.V. Fluorscent X-ray image intensifying screen. 4,205,116, Cl. 428-409.000.
van Linge, Douwe J.: *See*—
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van Soest, Gerrit J. Wheel conversion kit for snow vehicle. 4,204,582, Cl. 180-183.000.
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Mehta, Madhu A.; Pitroda, Satyan G.; and Vasanthkumar, Sagunabalan, 4,205,203, Cl. 370-110.000.
Vassal, Louis J.: *See*—
Maubois, Jean-Louis J.; Mocquot, Germain P. C. B.; and Vassal, Louis J., 4,205,090, Cl. 426-40.000.
VDO Adolf Schindling AG: *See*—
Gothe, Diethard; Nuske, Jeffrey J.; and Friedrich, Jurgen, 4,204,427, Cl. 73-304.00C.
Veb Kombinat Fortschritt Landmaschinen Neustadt In Sachsen: *See*—
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.
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Nicholson, Richard R.; Smith, Ray E.; and Shukla, Jayendra G., 4,205,022, Cl. 260-953.000.
Onore, Michael J.; and Mettille, Francis J., 4,205,009, Cl. 260-464.000.
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Fuller, Paul, 4,204,640, Cl. 235-476.000.
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Vihko, Pirkko. Method of purification of human prostatic acid phosphatase. 4,205,130, Cl. 435-196.000.
Villa, Alfred S. Convertible seat-bed. 4,204,288, Cl. 5-47.000.
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Hendy, Brian N.; Mathews, Carl F.; Nield, Eric; Rose, John B.; and Vincent, Peter I., 4,205,020, Cl. 525-275.000.
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Visky nee Gombos, Zsuzsa: *See*—
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Vogel, John D., to Tokheim Corporation. Bi-directional pump. 4,204,810, Cl. 417-244.000.
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Lever, Robert C., 4,204,497, Cl. 118-634.000.
Volz, Patricia S.: *See*—
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von Hagens, Gunther. Animal and vegetal tissues permanently preserved by synthetic resin impregnation. 4,205,059, Cl. 427-4.000.
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Streets, Roger L.; Rabito, Thomas G.; and Von Kamp, John, 4,204,987, Cl. 260-29.20E.
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Voth, Elmer D.: *See*—
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Bullock, Norman J., 4,204,338, Cl. 34-35.000.
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Mugnai, Giorgio; and Vietto, Paolo E., 4,204,379, Cl. 53-512.000.
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WABCO Westinghouse GmbH: *See*—
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Wiest, Hubert; Ludwig, Peter; Hafener, Klaus; and Lieb, Erwin, 4,205,161, Cl. 528-487.000.

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Seifert, Dieter; Regler, Dieter; Ofenmacher, Volker; Moritz, Alfred; Freudlsperger, August; and Berger, Walter, 4,204,515, Cl. 125-16.00R.

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Mitchell, Howard L., III; and Waghorne, Robert H., 4,205,194, Cl. 585-407.000.

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Wagner, Daniel B.; Pick, Anthony J.; and Feingers, Judith, to Ames-Yissum, Ltd. Column chromatography specific binding assay method and test kit. 4,205,058, Cl. 424-1.000.

Wagner, Hans A., to G. D. Searle & Co. N-[4-Azido-5-(2-ethoxyethyl)-6-phenyl-2-pyrimidinyl]acetamide and congeners. 4,205,169, Cl. 544-323.000.

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Schatz, Franz; Stammbach, Christian; Thiele, Kurt; Wagner-Jauregg, Theodor W.; Zirngibl, Ludwig; Fischer, Johanna; and Jahn, Ulrich, 4,204,998, Cl. 260-326.150.

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Waldmann, Hermann: *See*—
Erche, Manfred; Filberich, Ludwig; Pove, Dusan; Waldmann, Hermann; and Weibelzahl, Manfred, 4,205,368, Cl. 363-35.000.

Walker, Hill M.; Sharpe, Max H.; and Simpson, William G., to United States of America, National Aeronautics and Space Administration. Cork-resin ablative insulation for complex surfaces and method for applying the same. 4,204,899, Cl. 156-212.000.

Walker, Joseph B. Light enhancement camera attachment. 4,204,761, Cl. 354-202.000.

Walker, Starnes E., to Phillips Petroleum Company. Chromatographic analyzer detector gain adjustment. 4,204,424, Cl. 73-23.100.

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Walters, Ian R.; and Emblem, Harold G., to Zirconal Processes Limited. Method for producing rigid articles of refractory fibers. 4,205,032, Cl. 264-63.000.

Wang, Chun S.; McGregor, Stanley D.; and Nestrick, Terry J., to Dow Chemical Company, The. Dehydrohalogenation of (polyhaloalkyl) benzenes with support Lewis acid catalysts. 4,205,015, Cl. 260-651.00R.

Ward, Frederick D., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Pneumatic ejector for bomb. 4,204,456, Cl. 89-1.50G.

Ward, Patrick C., to Westinghouse Electric Corp. Internal shorting fuse for a high-intensity discharge lamp. 4,205,258, Cl. 315-73.000.

Ward, Peter J., to Lucas Industries Limited. Internal combustion engine fuel control system. 4,205,378, Cl. 364-431.000.

Wardle, Malcolm R.: *See*—
Porter, Cyril A.; and Wardle, Malcolm R., 4,205,326, Cl. 340-147.00R.

Warfield, Glenn R.: *See*—
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Waring, Wilson S., to Imperial Chemical Industries Limited. Acetic acid derivatives. 4,205,087, Cl. 424-317.000.

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Satzinger, Gerhard; Herrmann, Manfred F.; and Hechtfischer, Gustav, 4,205,078, Cl. 424-274.000.

Warren, Kenneth W.; and Prestridge, Floyd L., to Combustion Engineering, Inc. Process for application of electrostatic fields to mixing and separating fluids. 4,204,934, Cl. 204-186.000.

Warren, Lyle D.; and Brewster, Robert W. Automatic sawmill. 4,204,798, Cl. 414-750.000.

Warren, Walter B.: *See*—
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Washington, Forest L., to General Electric Company. Ground fault protection system. 4,205,358, Cl. 361-44.000.

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McAleer, William J.; and Wasmuth, Edward H., 4,204,989, Cl. 260-112.00B.

Watanabe, Hideo: *See*—
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Watanabe, Masakatsu, to Hochiki Corporation. Remote control variable attenuation device for an antenna amplifier. 4,205,269, Cl. 455-4.000.

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Ono, Takezo; Iribe, Seiki; and Watanabe, Mineo, 4,204,930, Cl. 204-180.00P.

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Watanabe, Takeshi: *See*—
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Watanabe, Yukihiro: *See*—
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Watson, Brian: *See*—
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Watts, Julian K.; and Yarker, Colin A., to Pilkington Brothers Limited. Method of and apparatus for producing a glass fibre bundle for use in optical communications systems. 4,204,852, Cl. 65-4.00A.

Wean United, Inc.: *See*—
Miller, Paul W., 4,204,413, Cl. 64-30.00E.

Webb, Jimmy L.; and Ligon, Woodfin V., to General Electric Company. Thermal detection system for failure in electrical apparatus and thermal detecting paint compositions. 4,204,428, Cl. 73-339.00R.

Weber, Jurgen; and Springer, Helmut, to Ruhrchemie Aktiengesellschaft. Process for the manufacture of 2,3-dimethylpentanal. 4,205,013, Cl. 568-451.000.

Webster, Henry A., III, to United States of America, Navy. Green flare compositions. 4,204,895, Cl. 149-19.600.

Wechsler, Ionel; Oberteuffer, John A.; Nolan, John J.; Kolm, Henry H.; Georgelis, Eric; and Arvidson, Bo R., to Allis-Chalmers Corporation. Self-purging seal. 4,204,948, Cl. 209-223.00R.

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Erche, Manfred; Filberich, Ludwig; Pove, Dusan; Waldmann, Hermann; and Weibelzahl, Manfred, 4,205,368, Cl. 363-35.000.

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Weinstein, Arthur H., to Goodyear Tire & Rubber Company, The. Diene interpolymers with halogenated monomers. 4,205,153, Cl. 526-292.000.

Weis, Ray P. Tennis playing apparatus. 4,204,678, Cl. 273-29.00A.

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Weiser, Milton M.: *See*—
Podolsky, Daniel K.; and Weiser, Milton M., 4,205,129, Cl. 435-193.000.

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Weka-Handelsgesellschaft m.b.H.: *See*—
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Wells, J. Scott: *See*—
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Werner, Peter: *See*—
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Wescom Switching, Inc.: *See*—
Mehta, Madhu A.; Pitroda, Satyan G.; and Vasanthkumar, Sagunabalan, 4,205,203, Cl. 370-110.000.

West Company, The: *See*—
Ravn, Jacob; and Conard, William A., 4,204,605, Cl. 215-295.000.

Westbay Instruments Ltd.: *See*—
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Western Electric Company, Inc.: *See*—
Arts, Jerold F.; Owen, William L., Jr.; and Tull, Bernie D., Jr., 4,205,239, Cl. 307-328.000.
Douglas, Robert R., 4,205,216, Cl. 219-121.00L.
Faber, Edward S.; Hovan, John J.; and Sinsheimer, Walter J., 4,204,737, Cl. 339-65.000.
Kalina, Robert F., 4,205,365, Cl. 361-308.000.

Westernacher, Helmut; Schimpff, Peter; and Botthof, Ferdinand, to Chemische Werke Buls A.G. Radial-flow reactor with heatable catalyst filling. 4,205,045, Cl. 422-192.000.

Westinghouse Electric Corp.: *See*—
Braytenbah, Andrew, 4,205,380, Cl. 364-494.000.
Calvino, Ben J., 4,205,208, Cl. 200-82.00R.
Cooper, Martin H., 4,204,911, Cl. 176-37.000.
Drucker, Melvin H., 4,205,360, Cl. 361-68.000.
Gipprich, John W., 4,205,282, Cl. 333-161.000.
Lin, Kou C.; Ellis, Belvin B.; and Burkhardt, Charles E., 4,205,288, Cl. 336-5.000.
Mallick, George T., Jr., 4,204,425, Cl. 73-116.000.
Schmitz, William E., 4,204,478, Cl. 104-247.000.
Sherwood, Edward F., 4,204,665, Cl. 256-65.000.
Shimp, Alan B., 4,205,361, Cl. 361-92.000.
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Westvaco Corporation: *See*—
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White Metal Rolling and Stamping Corp.: *See*—
Larson, Clayton E., 4,204,587, Cl. 182-228.000.
Whitfield Wylie Limited: *See*—
Gunn, Christopher J.; and Barker, Joseph, 4,204,624, Cl. 227-45.000.
Whitsel, Jay F., to Budd Company, The. Ultrasonic testing of welds in wheels. 4,204,434, Cl. 73-622.000.
WIBAU GmbH: *See*—
Merz, Georg; and Gehrmann, Heinz, 4,205,384, Cl. 364-555.000.
Wick, Emil, to United States of America, Agriculture. Apparatus for fermenting liquids. 4,205,133, Cl. 435-287.000.
Wicksell, Hans A.; Stahl, Stig; and Lofstedt, Ingemar G. Device for waxing skis. 4,204,693, Cl. 280-809.00T.
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Wiegmann, William: *See*—
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Wiest, Hubert; Ludwig, Peter; Hafener, Klaus; and Lieb, Erwin, to Wacker-Chemie GmbH. Process for reducing content of free vinyl chloride by posttreating copolymer with redox catalyst. 4,205,161, Cl. 528-487.000.
Wikstrom, Axel T., to AB Scandinavian Energy Saving Co. Devices for cleaning heating batteries. 4,204,572, Cl. 165-95.000.
Wilcke, Robert: *See*—
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Willems, Gerardus A. M., to U.S. Philips Corporation. Method and device for welding in a thermally ionized gas. 4,205,215, Cl. 219-121.00P.
Williams, Bruce T. High speed electrostatic voltmeter. 4,205,267, Cl. 324-458.000.
Williams, Edward W.: *See*—
Barlow, William A.; Rhodes, Maurice; Sherliker, Francis R.; and Williams, Edward W., 4,204,933, Cl. 204-181.00N.
Williams, George C.; and Fay, Edward W., to Alden Research Foundation. Paper feed control. 4,205,323, Cl. 346-165.000.
Williams (Hounslow) Limited: *See*—
Paskins, Keith N.; Redman, Duncan C.; and Turner, Ian D., 4,204,879, Cl. 106-311.000.
Williams, Joe E.: *See*—
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Williams, Kenneth R.: *See*—
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Williams, Stanley A. Electrode type water heating boiler. 4,205,222, Cl. 219-290.000.
Williams, William G.: *See*—
Bellhouse, Brian J.; and Williams, William G., 4,204,283, Cl. 3-1.500.
Willkes, Robert J.: *See*—
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Wilson, David A.; and McCrary, Avis L., to Dow Chemical Company, The. Non-yellowing compositions containing hexamethylenetetramine 1,3-dichloropropene salts. 4,205,065, Cl. 424-81.000.
Wilson, William J. Solar heaters. 4,204,522, Cl. 126-447.000.
Winget Limited: *See*—
Bates, Leonard T., 4,204,773, Cl. 366-18.000.
Wingler, Frank: *See*—
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Liebig, Lothar; Wingler, Frank; Humme, Gert; and Prinz, Richard, 4,205,141, Cl. 525-67.000.
Winn, Clarence W., to Arnold Engineering Company, The. Method of making a lead frame. 4,204,317, Cl. 29-827.000.
Winter, Klaus: *See*—
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Wise, Kennard L.; and Schroeder, George H., to Tecumseh Products Company. Explosion resistant overload and relay mounting for explosion resistant motor. 4,205,246, Cl. 310-68.00C.
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Wolters, Tjako A., to Ballast-Nedam Groep N.V., Amsterdamse Ballast Bagger en Grond (Amsterdam Ballast/Dredging) B.V. and Banegbo B.V. Device for cutting loose hard ground material. 4,204,347, Cl. 37-67.000.
Wood, Ernest: *See*—
Samuels, Peter B.; and Wood, Ernest, 4,204,526, Cl. 128-1.00R.
Woodger, Andrew, to BBC Brown Boveri & Company Limited. Turboset support. 4,204,804, Cl. 415-219.00R.
Workman, John, to S.B.W. Engineers Limited. Method of making cast windings for electric motors. 4,204,314, Cl. 29-597.000.
Worley, George W., to Troxel Manufacturing Company. Means for attaching a cover to a bicycle saddle. 4,204,713, Cl. 297-214.000.
Wright, John W.; and Gross, William H., to National Semiconductor Corporation. Audio amplifier with low AM radiation. 4,205,276, Cl. 330-294.000.
WSBM Company, Inc.: *See*—
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Wu, E-ming: *See*—
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Wu, Tai-Wing; and Sullivan, Sheryl S., to Eastman Kodak Company. Fluorimetric analysis method for bilirubin. 4,204,839, Cl. 23-230.00B.
Wu, Yeongchi; and Nowacki, Christopher A., to Rehabilitation Institute of Chicago. Disposable urethral catheter assembly. 4,204,527, Cl. 128-762.000.
Wurfel, Reinhart, to AGFA-Gevaert, A.G. Apparatus for removing exposed films and backing strips from cassettes. 4,204,620, Cl. 226-91.000.
Wyner, Jay S., to Therma-Plex. Apparatus for applying a liquid to a surface. 4,204,495, Cl. 118-300.000.
Wynn, Edward J.; and Bryant, Cal L., to Sperry Rand Corporation. Bale alignment mechanism actuating device. 4,204,792, Cl. 414-36.000.
Wysocki, Tadeusz S.: *See*—
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Xerox Corporation: *See*—
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Tates, Donald W., 4,204,727, Cl. 355-3.00R.
Traister, Robert L., 4,204,670, Cl. 271-287.000.
Yakushenko, Evgeny A.: *See*—
Bakanovich, Eduard A.; Orlov, Mikhail A.; Kostjuk, Sergei F.; Shmerko, Vladimir P.; Gagen, Igor E.; Gringlaz, Aron G.; Kulakov, Valery M.; Lysov, Valery B.; Menkov, Alexandr V.; Pikin, Nikolai I.; Chetverikov, Vladimir N.; Melnik, Nikolai I.; Novikov, Vladimir I.; Popov, Alexandr N.; and Yakushenko, Evgeny A., 4,205,383, Cl. 364-554.000.
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Yamada, Minoru; and Nakagawa, Yasutsugu, to Konishiroku Photo Industry Co., Ltd. Camera with built-in motor. 4,204,759, Cl. 354-152.000.
Yamada, Shigetaka, to Citizen Watch Co., Ltd. Light-transmitting, polycrystalline alumina body and method for producing the same. 4,204,874, Cl. 106-73.400.
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Sugiyama, Masaaki; and Yuda, Takuo, 4,204,960, Cl. 210-232.000.
Yamakoshi, Kenichi, to Asahi Medical Co., Ltd. Limb blood flowmeter. 4,204,545, Cl. 128-693.000.
Yamamoto, Masahiro; Okamoto, Yasunari; Itoh, Tsutomu; and Masuda, Senichi, to Onoda Cement Co., Ltd. Safety type electric field curtain apparatus. 4,205,359, Cl. 361-58.000.
Yamamoto, Tadao; Takekawa, Hiroshi; Banno, Taichi; and Koshiishi, Kiyozo, to Olympus Optical Co., Ltd. Method for measuring ion activity. 4,204,917, Cl. 204-1.00T.
Yamamoto, Yoshihiro; Sakurai, Kenji; and Tanaka, Hiroshi, to NGK Spark Plug Co., Ltd. Sintered ceramic body for cutting tools. 4,204,873, Cl. 106-43.000.
Yamamoto, Yousuke, to Nippon Telegraph and Telephone Public Corporation. Lateral transistor with multi-base contacts. 4,205,333, Cl. 357-35.000.
Yamanaka, Mikio: *See*—
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Watts, Julian K.; and Yarker, Colin A., 4,204,852, Cl. 65-4.00A.
Yasui, Hiroshi; and Ichimura, Yoshiaki, to Japan Aviation Electronics Industry, Ltd. Means for locking a circuit board to a connector. 4,204,722, Cl. 339-17.0CF.
Yasukawa, Akio: *See*—
Oguro, Tomokatsu; Sakamoto, Tatsuji; and Yasukawa, Akio, 4,205,257, Cl. 315-39.690.
Yasunaga, Ryuichi; Tsutsumi, Shinya; and Kuroda, Mototsugu. Vacuum cleaner. 4,204,297, Cl. 15-323.000.
Yigdall, Jeffrey S.; and Zahler, James A., to PPG Industries, Inc. Edge stretching apparatus including insulated seal. 4,204,856, Cl. 65-157.000.
Yoder, John B.: *See*—
Maul, Stephen B.; Lemke, Paul A.; Gerner, Walter L.; and Yoder, John B., 4,204,364, Cl. 47-1.100.

Yokogawa, Tomohisa: *See*—
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,270, Cl. 455-158.000.
Okatani, Masanao; Onishi, Hiroshi; Ishibashi, Yoshiaki; Sato, Reisuke; Suganuma, Hisashi; Yokogawa, Tomohisa; Ueki, Yoshiharu; Kama, Haruo; Kosuga, Tadashi; and Ogawa, Tadashi, 4,205,353, Cl. 360-61.000.
Yokota, Takashi: *See*—
Kawazu, Motoaki; Yokota, Takashi; Inokuchi, Toshiyuki; and Kanmoto, Yoshiaki, 4,205,349, Cl. 358-294.000.
Yokoyama, Henry; Hayman, Ernest P.; Hsu, Wan-Jean; and Poling, Stephen M., to United States of America, Agriculture. Method of increasing the yield of hydrocarbons from plants. 4,204,859, Cl. 71-121.000.
Yonekubo, Ken, to Olympus Optical Co., Ltd. Focal relay lens system for an inverted microscope. 4,204,748, Cl. 350-228.000.
Yoo, Jin S.; Burk, Emmett H., Jr.; and Karch, John A., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,204,840, Cl. 44-1.0SR.
Yoshida, Akira: *See*—
Aoyama, Tsuyoshi; Hayashi, Toshimasa; Toba, Hirotaka; Yoshida, Akira; Goto, Kenji; and Kawakama, Motoaki, 4,205,040, Cl. 264-233.000.
Yoshida, Kotaro: *See*—
Kado, Satoshi; Yamazaki, Taketomo; Sakamoto, Tetsu; Yamanaka, Mikio; and Yoshida, Kotaro, 4,204,862, Cl. 75-124.000.
Yoshida, Masako: *See*—
Ohashi, Takashi; Kojima, Minoru; Yoshida, Masako; Okuyama, Toru; and Sakata, Ryozo, 4,205,136, Cl. 521-118.000.
Yoshida, Matuju, to Nippondenso Co., Ltd. Method and apparatus for initializing vehicle-mounted computers. 4,205,376, Cl. 364-424.000.
Yoshida, Shigeki: *See*—
Kawagai, Kenji; and Yoshida, Shigeki, 4,205,263, Cl. 323-22.00R.
Yoshida, Tadao, to Sony Corporation. Pulse signal amplifier. 4,205,273, Cl. 330-251.000.
Yoshida, Tomio: *See*—
Shima, Takesaburo; Kozima, Hiroshi; Yoshida, Tomio; and Nakamura, Joji, 4,205,019, Cl. 525-243.000.
Yoshida, Yuji: *See*—
Kurata, Kenzi; Fukumoto, Toshito; Yoshida, Yuji; Kusama, Masanori; and Tsuruta, Shintaro, 4,204,915, Cl. 203-2.000.
Yoshinaga, Yasukazu: *See*—
Minoura, Nobuo; Matsumura, Isao; Yoshinaga, Yasukazu; Abumi, Takao; and Nakai, Kazuhiro, 4,205,347, Cl. 358-191.100.
Young, Lewis B.; and Burress, George T., to Mobil Oil Corporation. Method for producing 3-alkylphenols and 1,3-dihydroxybenzene. 4,205,189, Cl. 568-768.000.
Young, Morris S.; and Larbalestier, David C., to Airco, Inc. Wrapped tantalum diffusion barrier. 4,205,119, Cl. 428-614.000.
Young, Paul T. K., to Orenbuch, Louis. Broadband miniature antenna. 4,205,317, Cl. 343-720.000.
Young, Prussin, MGK, J.V.: *See*—
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,205,096, Cl. 427-4.000.
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., to Young, Prussin, MGK, J.V. Case III (C) adherent controlled release pesticide. 4,205,096, Cl. 427-4.000.
Yu, Chia-Nien, to Morton-Norwich Products, Inc. 2-[5-(4-Chlorophenyl)furfuryl]-1,3,-propanediol. 4,205,003, Cl. 260-347.800.
Yuda, Takuo: *See*—
Sugiyama, Masaaki; and Yuda, Takuo, 4,204,960, Cl. 210-232.000.
Yuhas, Drew J.: *See*—
Hall Jr., Harleston J.; Sassin, Roger I.; and Yuhas, Drew J., 4,204,681, Cl. 273-73.00C.
Yui, Yoshio: *See*—
Kouno, Akiyoshi; Morishita, Masanobu; and Yui, Yoshio, 4,205,340, Cl. 358-130.000.
Zafmedico Corp.: *See*—
Termanini, Zafer A., 4,204,528, Cl. 128-6.000.
Zagorodnaya, Galina A.: *See*—
Khutoretsky, Garri M.; Fridman, Vladimir M.; Zagorodnaya, Galina A.; Vorontsov, Alexandr I.; Ignatiev, Anatoly D.; and Sudarikov, Vasily L., 4,204,313, Cl. 29-596.000.
Zahler, James A.: *See*—
Yigdall, Jeffrey S.; and Zahler, James A., 4,204,856, Cl. 65-157.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
de Maight, Winfried, 4,204,584, Cl. 180-133.000.
Zaman, Shakir U.: *See*—
Giuggio, Nicholas; Noyes, Richard C.; and Zaman, Shakir U., 4,204,909, Cl. 176-22.000.
Zamojdo, Rudolf: *See*—
Nowak, Edmund; Zamojdo, Rudolf; Parda, Andrzej; Kurdowski, Wieslaw; and Jankowski, Stefan, 4,204,836, Cl. 432-58.000.
Zani, Tarcisio. Cooking utensil. 4,204,607, Cl. 220-68.000.
Zeilinger, Philip T.: *See*—
Carter, William L.; Greathouse, Jack F.; and Zeilinger, Philip T., 4,204,811, Cl. 417-288.000.
Zeitler, Karl-Heinz: *See*—
Auracher, Franz; Zeitler, Karl-Heinz; and Rauscher, Walter, 4,204,310, Cl. 29-445.000.
Zenith Radio Corporation: *See*—
Bing, Valentijn B.; and Neis, Donald A., 4,204,302, Cl. 29-25.130.
Gilchrist, Forbes D.; Miller, Robert L.; and Myers, Richard W., 4,205,280, Cl. 333-151.000.
Zestermann, Mary J.; and Hussar, John F., to Cincinnati Milacron Chemicals Inc. Ester substituted oxazolines. 4,205,176, Cl. 548-239.000.
Zherebtsov, Evgeny R.: *See*—
Menshutin, Vasily P.; Akutin, Modest S.; Iovdalsky, Nikolai V.; Minakova, Alla N.; Zherebtsov, Evgeny R.; Sokolov, Anatoly D.; Abramov, Vsevolod V.; Melekhova, Galina D.; and Ustkachkintsev, Alexandr N., 4,205,030, Cl. 264-40.100.
Zirconal Processes Limited: *See*—
Walters, Ian R.; and Emblem, Harold G., 4,205,032, Cl. 264-63.000.
Zirngibl, Ludwig: *See*—
Schatz, Franz; Stammbach, Christian; Thiele, Kurt; Wagner-Jauregg, Theodor W.; Zirngibl, Ludwig; Fischer, Johanna; and Jahn, Ulrich, 4,204,998, Cl. 260-326.150.
Zumpe, Bernd: *See*—
Eistert, Theodor; Schmidt, Gerhard; Noack, Christian; Teichmann, Manfred; Zumpe, Bernd; Eidam, Manfred; Spaida, Hans-Peter; Rauschenbach, Stefan; Paulisch, Karlheinz; and Scholz, Siegfried, 4,204,387, Cl. 56-98.000.
Zwep, Gerrit, to U.S. Philips Corporation. X-ray tube for the examination of fine structures. 4,205,251, Cl. 313-330.000.
Zwirlein, John F., to Olin Corporation. Polyurethane foam generating apparatus. 4,204,977, Cl. 252-359.00E.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MAY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Babington, Robert S. Spraying devices, in particular nebulizing devices. Re. 30,285, Cl. 261-78.00A.

Carborundum Company, The: *See*—
Coppola, John A.; and Smoak, Richard H., Re. 30,286, Cl. 264-65.000.

Coppola, John A.; and Smoak, Richard H., to Carborundum Company, The. Method of producing high density silicon carbide product. Re. 30,286, Cl. 264-65.000.

Doodewaard, Jean: *See*—
Marx, Arthur F.; and Doodewaard, Jean, Re. 30,287, Cl. 562-503.000.

Dow Chemical Company, The: *See*—
Frenier, Wayne W.; and Settineri, William J., Re. 30,283, Cl. 252-151.000.

Frenier, Wayne W.; and Settineri, William J., to Dow Chemical Company, The. Sulfonium compounds as corrosion inhibitors in aqueous acidic cleaning solutions. Re. 30,283, Cl. 252-151.000.

Gist-Brocades N.V.: *See*—
Marx, Arthur F.; and Doodewaard, Jean, Re. 30,287, Cl. 562-503.000.

Hackett, Kenneth R., to Pittway Corporation. Intrusion detection system. Re. 30,288, Cl. 343-5.0PD.

Hunt, Merrill R.; Ladas, Christopher A.; and Mastroianni, Sal T., to Motorola, Inc. Double master mask process for integrated circuit manufacture. Re. 30,282, Cl. 148-1.500.

Ladas, Christopher A.: *See*—
Hunt, Merrill R.; Ladas, Christopher A.; and Mastroianni, Sal T., Re. 30,282, Cl. 148-1.500.

Magee, Walter L., Jr., to Stauffer Chemical Company. Polymeric alkoxysilanes. Re. 30,284, Cl. 556-428.000.

Marathon Oil Company: *See*—
Tackett, James E.; and Stewart, Paul H., Re. 30,281, Cl. 137-13.000.

Marx, Arthur F.; and Doodewaard, Jean, to Gist-Brocades N.V. 19 Hydroxy prostaglandins. Re. 30,287, Cl. 562-503.000.

Mastroianni, Sal T.: *See*—
Hunt, Merrill R.; Ladas, Christopher A.; and Mastroianni, Sal T., Re. 30,282, Cl. 148-1.500.

Motorola, Inc.: *See*—
Hunt, Merrill R.; Ladas, Christopher A.; and Mastroianni, Sal T., Re. 30,282, Cl. 148-1.500.

Pittway Corporation: *See*—
Hackett, Kenneth R., Re. 30,288, Cl. 343-5.0PD.

Settineri, William J.: *See*—
Frenier, Wayne W.; and Settineri, William J., Re. 30,283, Cl. 252-151.000.

Smoak, Richard H.: *See*—
Coppola, John A.; and Smoak, Richard H., Re. 30,286, Cl. 264-65.000.

Stauffer Chemical Company: *See*—
Magee, Walter L., Jr., Re. 30,284, Cl. 556-428.000.

Stewart, Paul H.: *See*—
Tackett, James E.; and Stewart, Paul H., Re. 30,281, Cl. 137-13.000.

Tackett, James E.; and Stewart, Paul H., to Marathon Oil Company. Transportation of waxy hydrocarbon mixture as a slurry. Re. 30,281, Cl. 137-13.000.

LIST OF PLANT PATENTEES

Briggs, Carroll G., to Upjohn Company, The. Tomato plant. 4,539, 5-27-80, Cl. 89.000.

Bringhurst, Royce S.; and Voth, Victor, to University of California, The Regents of the. Strawberry plant. 4,538, 5-27-80, Cl. 49.000.

Flemer, William, III, to Treesearch. *Prunus subhirtella*. 4,540, 5-27-80, Cl. 37.000.

Treesearch: *See*—
Flemer, William, III, 4,540, Cl. 37.000.

University of California, The Regents of the: *See*—
Bringhurst, Royce S.; and Voth, Victor, 4,538, Cl. 49.000.

Upjohn Company, The: *See*—
Briggs, Carroll G., 4,539, Cl. 89.000.

Voth, Victor: *See*—
Bringhurst, Royce S.; and Voth, Victor, 4,538, Cl. 49.000.

LIST OF DESIGN PATENTEES

Abbott, Clarence F. Combined waterfall and garden pond. 255,142, 5-27-80, Cl. D23-13.000.

Abbott, Clarence F. Garden pond. 255,143, 5-27-80, Cl. D23-13.000.

Abbott, Clarence F. Combined waterfall and garden pond. 255,144, 5-27-80, Cl. D23-13.000.

Adkinson, Joseph E. Cabinet or similar article. 255,071, 5-27-80, Cl. D6-154.000.

Adkinson, Joseph E. Breakfront or the like. 255,072, 5-27-80, Cl. D6-154.000.

Adkinson, Joseph E. Cocktail table. 255,074, 5-27-80, Cl. D6-175.000.

Adkinson, Joseph E. Cocktail table. 255,075, 5-27-80, Cl. D6-175.000.

Adkinson, Joseph E. Cocktail table. 255,076, 5-27-80, Cl. D6-177.000.

Advertising Metal Display Co.: *See*—
Slaga, Case J.; and Nelson, Douglas, 255,070, Cl. D6-114.000.

Aktiebolaget Bofors: *See*—
Korpi, Jouko K., 255,119, Cl. D15-29.000.

Alexander, Steven B., to American Turbo-Pak, Inc. Engine exhaust header pipe unit. 255,112, 5-27-80, Cl. D12-194.000.

Allsop, Ivor J. Combined carrying and retaining device for shoes. 255,064, 5-27-80, Cl. D3-36.000.

American Turbo-Pak, Inc.: *See*—
Alexander, Steven B., 255,112, Cl. D12-194.000.

Anchor Hocking Corporation: *See*—
Gobleck, Peter A., Jr., 255,079, Cl. D7-3.000.
Gobleck, Peter A., Jr., 255,080, Cl. D7-3.000.

Arbib, Philip B., to Bib Hi-Fi Accessories Ltd., a British Company of Kelsey House. Gramophone record cleaning device. 255,088, 5-27-80, Cl. D7-161.000.

Arvey Corporation: *See*—
Gordon, William D., Sr., 255,131, Cl. D21-114.000.

Ayukawa, Isao; Takaoka, Tamaki; and Hayano, Teruko, to Sharp Kabushiki Kaisha (Sharp Corp.). Electric shaver. 255,166, 5-27-80, Cl. D28-50.000.

Balzano, Alfiero F. Exercise support. 255,130, 5-27-80, Cl. D21-191.000.

Bardeau, William M. Automatic coffee maker. 255,120, 5-27-80, Cl. D15-113.000.

Bare, Rex O.: *See*—
Robinson, Earl F.; Bare, Rex O.; and Hayob, Wayne, 255,148, Cl. D24-8.000.

Barrera, John R. Carving board. 255,082, 5-27-80, Cl. D7-46.000.

Baxter Travenol Laboratories, Inc.: *See*—
Jess, Thurman S.; and Zissimopoulos, Nicholas, 255,147, Cl. D24-8.000.

Bevilacqua, Albert J., to C. R. Bard, Inc. Dual terminal electrode for medical monitoring. 255,149, 5-27-80, Cl. D24-29.000.

Bib Hi-Fi Accessories Ltd., a British Company of Kelsey House: *See*—
Arbib, Philip B., 255,088, Cl. D7-161.000.

Bienwald, Wolfgang F.; and Tufano, Anthony, to Leviton Manufacturing Company, Inc. Snap-in switch housing. 255,114, 5-27-80, Cl. D13-32.000.

Bodenrader, Frederick F.; and Gilleo, John F., Jr., to GTE Sylvania Incorporated. Indicator lamp assembly. 255,106, 5-27-80, Cl. D10-114.000.

Booty, Donald J. Electric clock. 255,101, 5-27-80, Cl. D10-15.000.

Borsuk, Robert; Crandall, Jerry; and Koslow, David, to Revlon, Inc. Display card holder for a nail polish bottle or the like. 255,099, 5-27-80, Cl. D9-261.000.

Bowen, John J. Table tennis paddle. 255,137, 5-27-80, Cl. D21-213.000.

Brentham, Jerry D. Arm curl exercising machine. 255,136, 5-27-80, Cl. D21-195.000.

Brimatco Corporation: *See—*
Dacunto, Alfred V., 255,090, Cl. D8-21.000.

Byrne, David S., to Warner-Lambert Company. Razor handle. 255,164, 5-27-80, Cl. D28-48.000.

Byrne, David S., to Warner-Lambert Company. Razor handle. 255,165, 5-27-80, Cl. D28-48.000.

C. R. Bard, Inc.: *See—*
Bevilacqua, Albert J., 255,149, Cl. D24-29.000.
Robinson, Earl F.; Bare, Rex O.; and Hayob, Wayne, 255,148, Cl. D24-8.000.

Cachet Designs, Inc.: *See—*
Petrie, Ross J., 255,084, Cl. D7-76.000.

Cardinal Industries, Inc.: *See—*
Subtirelu, Monica P., 255,156, Cl. D25-22.000.
Subtirelu, Monica P., 255,157, Cl. D25-22.000.

Carroll, James C.; and Johnson, Lewis T., to Phillips Petroleum Company. Bakery tray or the like. 255,097, 5-27-80, Cl. D9-248.000.

CBS Inc.: *See—*
Strongin, Ned, 255,129, Cl. D21-17.000.

Cha Industries: *See—*
Mahl, Gunard O. B., 255,122, Cl. D15-199.000.

Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., to Johnson & Johnson. Animate figure toy. 255,135, 5-27-80, Cl. D21-150.000.

Chen, Evan N., to Warner-Lambert Company. Safety razor cartridge with clean-out device. 255,161, 5-27-80, Cl. D28-47.000.

Chen, Evan N., to Warner-Lambert Company. Safety razor cartridge with clean-out device. 255,163, 5-27-80, Cl. D28-47.000.

Christie, Cary L. Turntable. 255,115, 5-27-80, Cl. D14-17.000.

Clark, Earl J., to Tandy Brands, Inc. Holster. 255,141, 5-27-80, Cl. D22-13.000.

CPG Products Corp.: *See—*
Nowak, Ralph M., 255,132, Cl. D21-129.000.

Crandall, Jerry: *See—*
Borsuk, Robert; Crandall, Jerry; and Koslow, David, 255,099, Cl. D9-261.000.

Dacunto, Alfred V., to Brimatco Corporation. Wrench. 255,090, 5-27-80, Cl. D8-21.000.

Dart Industries Inc.: *See—*
Free, John H.; and Painter, David L., 255,085, Cl. D7-94.000.

De Dietrich & Cie: *See—*
Kuhl, Eugene, 255,146, Cl. D23-105.000.

Duerr, Dennis C. Contact printing cabinet. 255,123, 5-27-80, Cl. D16-29.000.

Etelson, Doris C., to Howard Johnson Company. Takeout food container. 255,096, 5-27-80, Cl. D9-219.000.

Ethyl Products Company: *See—*
Hayes, Thomas H.; and Kruck, Ralph E., 255,098, Cl. D9-258.000.

Filice, George E. Paint brush prop. 255,100, 5-27-80, Cl. D9-289.000.

Free, John H.; and Painter, David L., to Dart Industries Inc. Yogurt maker. 255,085, 5-27-80, Cl. D7-94.000.

Freedom Zoo, Inc., The: *See—*
Tingey, Sheri, 255,133, Cl. D21-148.000.
Tingey, Sheri, 255,134, Cl. D21-148.000.

Furnell, Glen H. Telephone booth. 255,067, 5-27-80, Cl. D6-25.000.

Fuzere Manufacturing Co., Inc.: *See—*
Ramorini, Lorin A., 255,081, Cl. D7-38.000.

Garza, Luis R.; and Tedesco, Francis A., to Lifetime Foam Products, Inc. Base for a van seat. 255,077, 5-27-80, Cl. D6-194.000.

Genal Strap, Inc.: *See—*
Hofman, Bronislaw L., 255,108, Cl. D11-3.000.

Gera, Mary Ann: *See—*
Gera, Robert A.; and Gera, Mary Ann, 255,068, Cl. D6-63.000.

Gera, Robert A.; and Gera, Mary Ann, to Kroehler Mfg. Co. Seat or similar article. 255,068, 5-27-80, Cl. D6-63.000.

Geronimo Trooper, Inc.: *See—*
Sermersheim, Gerald M., 255,138, Cl. D21-242.000.

Gilleo, John F., Jr.: *See—*
Bodenrader, Frederick F.; and Gilleo, John F., Jr., 255,106, Cl. D10-114.000.

Gillette Company, The: *See—*
Gray, Michael J., 255,160, Cl. D28-46.000.
Trotta, Robert A., 255,162, Cl. D28-47.000.

Gobleck, Peter A., Jr., to Anchor Hocking Corporation. Combined decal and glass receptacle. 255,079, 5-27-80, Cl. D7-3.000.

Gobleck, Peter A., Jr., to Anchor Hocking Corporation. Combined decal and glass receptacle. 255,080, 5-27-80, Cl. D7-3.000.

Gordon, William D., Sr., to Arvey Corporation. Toy doll house. 255,131, 5-27-80, Cl. D21-114.000.

Gould Inc., Modicon Division: *See—*
MacDonald, John B.; and Mercadante, Michael J., 255,116, Cl. D14-43.000.

Gray, Michael J., to Gillette Company, The. Razor. 255,160, 5-27-80, Cl. D28-46.000.

Groundworks, Inc.: *See—*
Kott, Gerald P., 255,083, Cl. D7-72.000.

GTE Sylvania Incorporated: *See—*
Bodenrader, Frederick F.; and Gilleo, John F., Jr., 255,106, Cl. D10-114.000.

Hadgis, Gregory S. Combined key ring and clip lock for holding a gas pump trigger in the open position. 255,066, 5-27-80, Cl. D3-62.000.

Haidek, Thomas N. Accessory mount for theodolite. 255,104, 5-27-80, Cl. D10-74.000.

Hanaford, Donald E. Gazebo. 255,158, 5-27-80, Cl. D25-23.000.

Hartung, Philip F.; and Tramonti, John J. Bottle. 255,093, 5-27-80, Cl. D9-168.000.

Hayano, Teruko: *See—*
Ayukawa, Isao; Takaoka, Tamaki; and Hayano, Teruko, 255,166, Cl. D28-50.000.

Hayes, Thomas H.; and Kruck, Ralph E., to Ethyl Products Company. Actuator cap for pressurized container or similar article. 255,098, 5-27-80, Cl. D9-258.000.

Hayob, Wayne: *See—*
Robinson, Earl F.; Bare, Rex O.; and Hayob, Wayne, 255,148, Cl. D24-8.000.

Hazama, Shigetoshi; and Ikeda, Matafumi, to Sharp Kabushiki Kaisha (Sharp Corp.). Calculating machine. 255,125, 5-27-80, Cl. D18-7.000.

Hetrick, Vernon L., to Meyer Products, Inc. Auxiliary light for vehicle having attached plow blade. 255,167, 5-27-80, Cl. D26-35.000.

Hill, Ernest H.: *See—*
Hill, Ernie H.; and Hill, Ernest H., 255,062, Cl. D2-381.000.

Hill, Ernie H.; and Hill, Ernest H. Competition gun belt for supporting gun boots. 255,062, 5-27-80, Cl. D2-381.000.

Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 255,108, 5-27-80, Cl. D11-3.000.

Honeywell Inc.: *See—*
Wolfe, Norbert T., 255,103, Cl. D10-51.000.

Houston, Isaac B. Golf ball holder. 255,063, 5-27-80, Cl. D2-400.000.

Howard Johnson Company: *See—*
Etelson, Doris C., 255,096, Cl. D9-219.000.

Hurco Manufacturing Co., Inc.: *See—*
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Hutec Corporation: *See—*
Pease, Hugh R.; and Stadtmiller, Malcolm L., 255,113, Cl. D13-11.000.

Ikeda, Matafumi: *See—*
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Ohie, Yoshihisa; and Ikeda, Matafumi, 255,126, Cl. D18-7.000.

Jess, Thurman S.; and Zissimopoulos, Nicholas, to Baxter Travenol Laboratories, Inc. Fluid metering apparatus. 255,147, 5-27-80, Cl. D24-8.000.

Johnson & Johnson: *See—*
Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., 255,135, Cl. D21-150.000.

Johnson, Lewis T.: *See—*
Carroll, James C.; and Johnson, Lewis T., 255,097, Cl. D9-248.000.

Kanold, Bernhard. Handle for screw drivers or the like. 255,091, 5-27-80, Cl. D8-83.000.

Kimberly-Clark Corporation: *See—*
Woon, Paul S., 255,150, Cl. D24-51.000.
Woon, Paul S., 255,151, Cl. D24-51.000.
Woon, Paul S., 255,152, Cl. D24-51.000.

Knoll International, Inc.: *See—*
Zapf, Otto W., 255,073, Cl. D6-161.000.

Kone Osakeyhtio: *See—*
Perjo, Pekka, 255,105, Cl. D10-108.000.

Korpi, Jouko K., to Aktiebolaget Bofors. Tooth for excavating equipment. 255,119, 5-27-80, Cl. D15-29.000.

Koslow, David: *See—*
Borsuk, Robert; Crandall, Jerry; and Koslow, David, 255,099, Cl. D9-261.000.

Kott, Gerald P., to Groundworks, Inc. Napkin ring. 255,083, 5-27-80, Cl. D7-72.000.

Kroehler Mfg. Co.: *See—*
Gera, Robert A.; and Gera, Mary Ann, 255,068, Cl. D6-63.000.

Kruck, Ralph E.: *See—*
Hayes, Thomas H.; and Kruck, Ralph E., 255,098, Cl. D9-258.000.

Kuhl, Eugene, to De Dietrich & Cie. Stove. 255,146, 5-27-80, Cl. D23-105.000.

Leviton Manufacturing Company, Inc.: *See—*
Bienwald, Wolfgang F.; and Tufano, Anthony, 255,114, Cl. D13-32.000.

Lifetime Foam Products, Inc.: *See—*
Garza, Luis R.; and Tedesco, Francis A., 255,077, Cl. D6-194.000.

Longly, James M.: *See—*
Van Horn, William R.; and Longly, James M., 255,118, Cl. D14-68.000.

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Mercadante, Michael J.: *See—*
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Hetrick, Vernon L., 255,167, Cl. D26-35.000.
Mobius, Werner. Pencil sharpener. 255,127, 5-27-80, Cl. D19-73.000.
Nederman, Bill P. P. Connection fitting for tubular conduits. 255,145, 5-27-80, Cl. D23-43.000.
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Slaga, Case J.; and Nelson, Douglas, 255,070, Cl. D6-114.000.
Nichols, Richard D. E. Buckleless belt. 255,061, 5-27-80, Cl. D2-380.000.
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Okazawa U.S.A. Inc.: *See—*
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Oneida Ltd.: *See—*
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Richmond, Colin B., II, 255,087, Cl. D7-150.000.
Painter, David L.: *See—*
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Palmer, Jack P. Electric powered tricycle. 255,111, 5-27-80, Cl. D12-110.000.
Parsons, Roger C. Athletic protective shirt or similar article. 255,056, 5-27-80, Cl. D2-27.000.
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Perjo, Pekka, to Kone Osakeyhtio. Up and down directional signal for an elevator. 255,105, 5-27-80, Cl. D10-108.000.
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Carroll, James C.; and Johnson, Lewis T., 255,097, Cl. D9-248.000.
Pirolozzi, Kenneth. Holder for a writing instrument or similar article. 255,128, 5-27-80, Cl. D19-82.000.
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Revlon, Inc.: *See—*
Borsuk, Robert; Crandall, Jerry; and Koslow, David, 255,099, Cl. D9-261.000.
Scalice, John J., 255,095, Cl. D9-191.000.
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Richmond, Colin B., II, to Oneida Ltd. Spoon or similar article. 255,087, 5-27-80, Cl. D7-150.000.
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Roch, Gerald V., to Hurco Manufacturing Co., Inc. Milling machine control panel. 255,121, 5-27-80, Cl. D15-138.000.
Ross, Preston. Household water leak indicator. 255,102, 5-27-80, Cl. D10-46.000.
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Selbee, James A. Portable post. 255,159, 5-27-80, Cl. D25-78.000.
Sermersheim, Gerald M., to Geronimo Trooper, Inc. Jump tower for amusement ride. 255,138, 5-27-80, Cl. D21-242.000.
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Ayukawa, Isao; Takaoka, Tamaki; and Hayano, Teruko, 255,166, Cl. D28-50.000.
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Ohie, Yoshihisa, 255,124, Cl. D18-7.000.
Ohie, Yoshihisa; and Ikeda, Matafumi, 255,126, Cl. D18-7.000.
Simpson, Danny E.: *See—*
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Slaga, Case J.; and Nelson, Douglas, to Advertising Metal Display Co. Hose clamp display rack. 255,070, 5-27-80, Cl. D6-114.000.
Slepetz, Richard V. Emergency vehicle warning light. 255,107, 5-27-80, Cl. D10-114.000.
Smith, James A. Electric baton for law enforcement personnel. 255,139, 5-27-80, Cl. D22-1.000.
Squier, Gary L. Live poultry transfer station. 255,109, 5-27-80, Cl. D12-60.000.
Stadtmiller, Malcolm L.: *See—*
Pease, Hugh R.; and Stadtmiller, Malcolm L., 255,113, Cl. D13-11.000.
Strongin, Ned, to CBS Inc. Game board. 255,129, 5-27-80, Cl. D21-17.000.
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Takaoka, Tamaki: *See—*
Ayukawa, Isao; Takaoka, Tamaki; and Hayano, Teruko, 255,166, Cl. D28-50.000.
Talley Industries, Inc.: *See—*
Walker, George A., 255,089, Cl. D8-4.000.
Tandy Brands, Inc.: *See—*
Clark, Earl J., 255,141, Cl. D22-13.000.
Tedesco, Francis A.: *See—*
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Trotta, Robert A., to Gillette Company, The. Razor blade assembly. 255,162, 5-27-80, Cl. D28-47.000.
Tufano, Anthony: *See—*
Bienwald, Wolfgang F.; and Tufano, Anthony, 255,114, Cl. D13-32.000.
Usami, Satoru: *See—*
Ohta, Kikuo; and Usami, Satoru, 255,117, Cl. D14-68.000.
Van Horn, William R.; and Longly, James M., to Reach Electronics, Inc. Paging terminal. 255,118, 5-27-80, Cl. D14-68.000.
Van Koert, John. Mirror or the like. 255,078, 5-27-80, Cl. D6-241.000.
Vetter, John D.: *See—*
Weast, Gerald T., 255,140, Cl. D22-7.000.
Walker, George A., to Talley Industries, Inc. Floral stem stripper or similar article. 255,089, 5-27-80, Cl. D8-4.000.
Walker, Rees D. Solar cap. 255,057, 5-27-80, Cl. D2-250.000.
Warner-Lambert Company: *See—*
Byrne, David S., 255,164, Cl. D28-48.000.
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Chen, Evan N., 255,161, Cl. D28-47.000.
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Wierdo, William J. Bedstead. 255,069, 5-27-80, Cl. D6-84.000.
Williams, D. Michael: *See—*
Chase, Richard A.; Williams, D. Michael; and Simpson, Danny E., 255,135, Cl. D21-150.000.
Wolfe, Norbert T., to Honeywell Inc. Room thermostat or similar article. 255,103, 5-27-80, Cl. D10-51.000.
Wong, Johnson N. S. Combined vial and supporting base. 255,092, 5-27-80, Cl. D9-12.000.
Woon, Paul S., to Kimberly-Clark Corporation. Embossed patterned sheet of material for sanitary napkins. 255,150, 5-27-80, Cl. D24-51.000.
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Jess, Thurman S.; and Zissimopoulos, Nicholas, 255,147, Cl. D24-8.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 27, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3

1	4,204,282
1.5	4,204,283
1.91	4,204,284

CLASS 4

427	4,204,285

CLASS 5

11	4,204,286
18 R	4,204,287
47	4,204,288
451	4,204,289

CLASS 8

478	4,204,290

CLASS 13

27	4,205,197

CLASS 15

3.1	4,204,291
28	4,204,292
79 R	4,204,293
185	4,204,294
209 D	4,204,295
316 R	4,204,296
323	4,204,297
344	4,204,298
415 R	4,204,299

CLASS 23

230 B	4,204,837
	4,204,839
230 R	4,204,838

CLASS 24

201 HE	4,204,300

CLASS 28

248	4,204,301

CLASS 29

25.13	4,204,302
26 A	4,204,303
	4,204,304
61 N	4,204,316
157.4	4,204,305
281.5	4,204,306
407	4,204,307
412	4,204,309
426.5	4,204,308
445	4,204,310
451	4,204,311
523	4,204,312
596	4,204,313
597	4,204,314
603	4,204,315
734	4,204,318
739	4,204,319
827	4,204,317

CLASS 30

386	4,204,320

CLASS 33

30 F	4,204,327
172 R	4,204,331
174 F	4,204,332
288	4,204,333
391	4,204,334
476	4,204,335

CLASS 34

5	4,204,336
31	4,204,337
35	4,204,338
75	4,204,339
225	4,204,340

CLASS 35

1	4,204,341
10.4	4,204,342
73	4,204,343

CLASS 36

34 A	4,204,344
97	4,204,345
114	4,204,346

CLASS 37

67	4,204,347
117.5	4,204,348
141 RS	4,204,349

CLASS 40

155	4,204,350
372	4,204,351
389	4,204,352

CLASS 42

1 T	4,204,353

CLASS 43

4.5	4,204,354
15	4,204,355
26.1	4,204,356

CLASS 44

1 SR	4,204,840
71	4,204,841

CLASS 46

74 D	4,204,357
76 R	4,204,358
83	4,204,359
98	4,204,360
116	4,204,361
	4,204,362
202	4,204,363

CLASS 47

1.1	4,204,364
41 R	4,204,365
58	4,204,366
71	4,204,367

CLASS 48

197 A	4,204,842
210	4,204,843

CLASS 49

67	4,204,368
319	4,204,369

CLASS 51

80 A	4,204,370
141	4,204,371

CLASS 52

64	4,204,372
204	4,204,373
208	4,204,374
239	4,204,375
309.1	4,204,376

CLASS 53

399	4,204,377
403	4,204,378
512	4,204,379
520	4,204,380
528	4,204,381
563	4,204,382

CLASS 55

10	4,204,844
257 PV	4,204,847
269	4,204,848
272	4,204,846
310	4,204,849

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10.2	4,204,383
10.5	4,204,384
14.3	4,204,385
14.4	4,204,386
98	4,204,387
320.1	4,204,388
330	4,204,389
	4,204,390

CLASS 57

1 R	4,204,391
18	4,204,392
301	4,204,393
334	4,204,394

CLASS 58

47	4,204,398

CLASS 60

39.03	4,204,401
39.06	4,204,402
371	4,204,405
398	4,204,406
641	4,204,407
740	4,204,404
743	4,204,403

CLASS 62

62	4,204,408
271	4,204,409
500	4,204,410

CLASS 64

2 P	4,204,411
17 R	4,204,412
30 E	4,204,413

CLASS 65

3 A	4,204,850
	4,204,851
4 A	4,204,852
25 A	4,204,845
106	4,204,853
	4,204,854
141	4,204,855
157	4,204,856

CLASS 66

145 R	4,204,414

CLASS 71

73	4,204,857
111	4,204,858
121	4,204,859

CLASS 72

52	4,204,415
204	4,204,416
206	4,204,417
352	4,204,418
356	4,204,419
439	4,204,420
	4,204,421

CLASS 73

4 R	4,204,422
23.1	4,204,423
	4,204,424
116	4,204,425
151	4,204,426
304 C	4,204,427
339 R	4,204,428
362 AR	4,204,429
423 A	4,204,430
423 R	4,204,431
599	4,204,432
620	4,204,433
622	4,204,434
626	4,204,435

CLASS 74

767	4,204,436

CLASS 75

10 R	4,204,860
73	4,204,861
124	4,204,862
234	4,204,863
257	4,204,864

CLASS 76

108 A	4,204,437

CLASS 81

9.22	4,204,438
57.37	4,204,439
111	4,204,440

CLASS 82

2.5	4,204,441
18	4,204,442

CLASS 83

37	4,204,443
56	4,204,444
146	4,204,446
171	4,204,447
177	4,204,448
328	4,204,449
461	4,204,450
658	4,204,451
880	4,204,445

CLASS 84

1.01	4,204,452
1.24	4,204,453
315	4,204,454
468	4,204,455
484	4,204,400

CLASS 89

1.5 G	4,204,456

CLASS 91

31	4,204,457
429	4,204,458
445	4,204,459
447	4,204,460
454	4,204,461

CLASS 93

36.5 R	4,204,462

CLASS 98

58	4,204,463

CLASS 99

286	4,204,464
293	4,204,465
443 C	4,204,466
494	4,204,467

CLASS 101

3 SP	4,204,468
9	4,204,469
28	4,204,470
410	4,204,471
426	4,204,472

CLASS 102

39	4,204,473
92.7	4,204,474
262	4,204,475

CLASS 104

2	4,204,476
106	4,204,477
247	4,204,478

CLASS 106

20	4,204,871
38.35	4,204,872
43	4,204,873
73.4	4,204,874
87	4,204,875
90	4,204,876
	4,204,877
104	4,204,878
311	4,204,879

CLASS 108

108	4,204,480

CLASS 111

3	4,204,491

CLASS 112

121.29	4,204,492
260	4,204,493

CLASS 114

222	4,204,494

CLASS 118

300	4,204,495
405	4,204,496
634	4,204,497
693	4,204,498

CLASS 119

5	4,204,499
52 R	4,204,500
72	4,204,501

CLASS 122

32	4,204,502
392	4,204,503

CLASS 123

1 A	4,204,481
32 EE	4,204,482
32 EL	4,204,483
32 SP	4,204,484
34 A	4,204,485
41.35	4,204,487
41.6	4,204,486
73 A	4,204,488
	4,204,489
102	4,204,490
119 B	4,204,504
119 EC	4,204,505
137	4,204,506
139 AW	4,204,507
148 E	4,204,508
	4,204,509
179 L	4,204,510
187.5 R	4,204,511
198 DB	4,204,513
198 F	4,204,512
	4,204,514

CLASS 125

16 R	4,204,515

CLASS 126

9 R	4,204,516
63	4,204,517
132	4,204,518
164	4,204,519
432	4,204,520
446	4,204,521
447	4,204,522
450	4,204,523

CLASS 128

1 D	4,204,524
1 R	4,204,525
	4,204,526
6	4,204,528
75	4,204,529
79	4,204,530
92 BC	4,204,531
132 D	4,204,532
133	4,204,533
134	4,204,534
202.13	4,204,535
204.22	4,204,536
214 R	4,204,537
	4,204,538
223	4,204,539
283	4,204,540
334 R	4,204,541
335.5	4,204,542
402	4,204,543
642	4,204,544
693	4,204,545
731	4,204,546
748	4,204,547
762	4,204,527
778	4,204,548
784	4,204,549

CLASS 131

171 R	4,204,550
178	4,204,551

CLASS 134

32	4,204,880

CLASS 136

89 PC	4,204,881
202	4,204,882

CLASS 137

13	Re.30,281
81 A	4,204,552
82	4,204,553
101	4,204,554
102	4,204,555
206	4,204,556
244	4,204,557
315	4,204,558
318	4,204,559
508	4,204,560
510	4,204,561

CLASS 138

132	4,204,562

CLASS 141

206	4,204,563
311 A	4,204,564

CLASS 148

1.5	Re.30,282
2	4,204,883
	4,204,884
12 B	4,204,885
15.5	4,204,886
26	4,204,889
31	4,204,887
	4,204,888
111	4,204,890
	4,204,891
145	4,204,892
175	4,204,893
188	4,204,894

CLASS 149

19.6	4,204,895

CLASS 150

7	4,204,565

CLASS 151

38	4,204,566

CLASS 152

209 D	4,204,567

CLASS 156

49	4,204,896
155	4,204,897
159	4,204,898
212	4,204,899
255	4,204,900
351	4,204,905
384	4,204,901
	4,204,902
394	4,204,903
497	4,204,904

CLASS 162

6	4,204,906
135	4,204,907

CLASS 164

87	4,204,568
166	4,204,569

CLASS 165

69	4,204,570
80 A	4,204,571
95	4,204,572
142	4,204,573

CLASS 166

305 R	4,204,574

CLASS 172

1	4,204,575
22	4,204,576
25	4,204,577
307	4,204,578
657	4,204,579

CLASS 173

48	4,204,580

CLASS 174

171	4,205,198

CLASS 176

19 LD	4,204,908
22	4,204,909
30	4,204,910
37	4,204,911

CLASS 178

19	4,205,199

CLASS 179

16 F	4,205,204
100.1 G	4,205,339
115.5 R	4,205,205
124	4,205,206

CLASS 180

9.28	4,204,583
133	4,204,584
183	4,204,582
190	4,204,581
219	4,204,585

CLASS 181

229	4,204,586

CLASS 182

228	4,204,587

CLASS 188

2 F	4,204,588

CLASS 192

27	4,204,589
99 R	4,204,590
	4,204,591

CLASS 198

750	4,204,592
781	4,204,593
827	4,204,594
836	4,204,595

CLASS 200

50 AA 4,205,207
82 R 4,205,208
163 4,205,209

CLASS 201

29 4,204,912

CLASS 202

168 4,204,913
176 4,204,914

CLASS 203

2 4,204,915
6 4,204,916

CLASS 204

1 T 4,204,917
24 4,204,918
29 4,204,919
98 4,204,920
4,204,921
105 R 4,204,922
129 4,204,923
129.35 4,204,924
152 4,204,925
157.1 H 4,204,926
159.18 4,204,927
159.23 4,204,928
180 P 4,204,930
180 R 4,204,929
181 N 4,204,931
4,204,933
181 R 4,204,932
186 4,204,934
192 F 4,204,935
192 R 4,204,936
219 4,204,937
252 4,204,938
258 4,204,939
272 4,204,940
296 4,204,941
298 4,204,942

CLASS 206

203 4,204,596
216 4,204,597
397 4,204,479
426 4,204,598
575 4,204,599
610 4,204,600

CLASS 208

50 4,204,943
120 4,204,944
4,204,945
181 4,204,946
243 4,204,947

CLASS 209

223 R 4,204,948
250 4,204,949
558 4,204,950
625 4,204,951

CLASS 210

31 C 4,204,952
58 4,204,953
59 4,204,954
61 4,204,955
87 4,204,956
98 4,204,957
178 4,204,958
195.1 4,204,959
232 4,204,960
4,204,961
316 4,204,962
321 B 4,204,963
370 4,204,964
447 4,204,965
455 4,204,966
459 4,204,967

CLASS 211

4 4,204,601
13 4,204,602

CLASS 212

49 4,204,603

CLASS 215

257 4,204,604
295 4,204,605
307 4,204,606

CLASS 219

10.81 4,205,210
69 W 4,205,212
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230 4,205,221
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501 4,205,223

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335 4,204,608
408 4,204,609

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296 4,205,350

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